

# Municipal Journal

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No. 4

## ROCHESTER'S SEWAGE TREATMENT PLANT

Twenty-Five Million Gallon Plant About Ready for Operation—To Treat Eighty-Two Million Gallons of Storm Sewage—Imhoff Tanks Without Filters—Power from Effluent—Mechanical Operation of Plant.

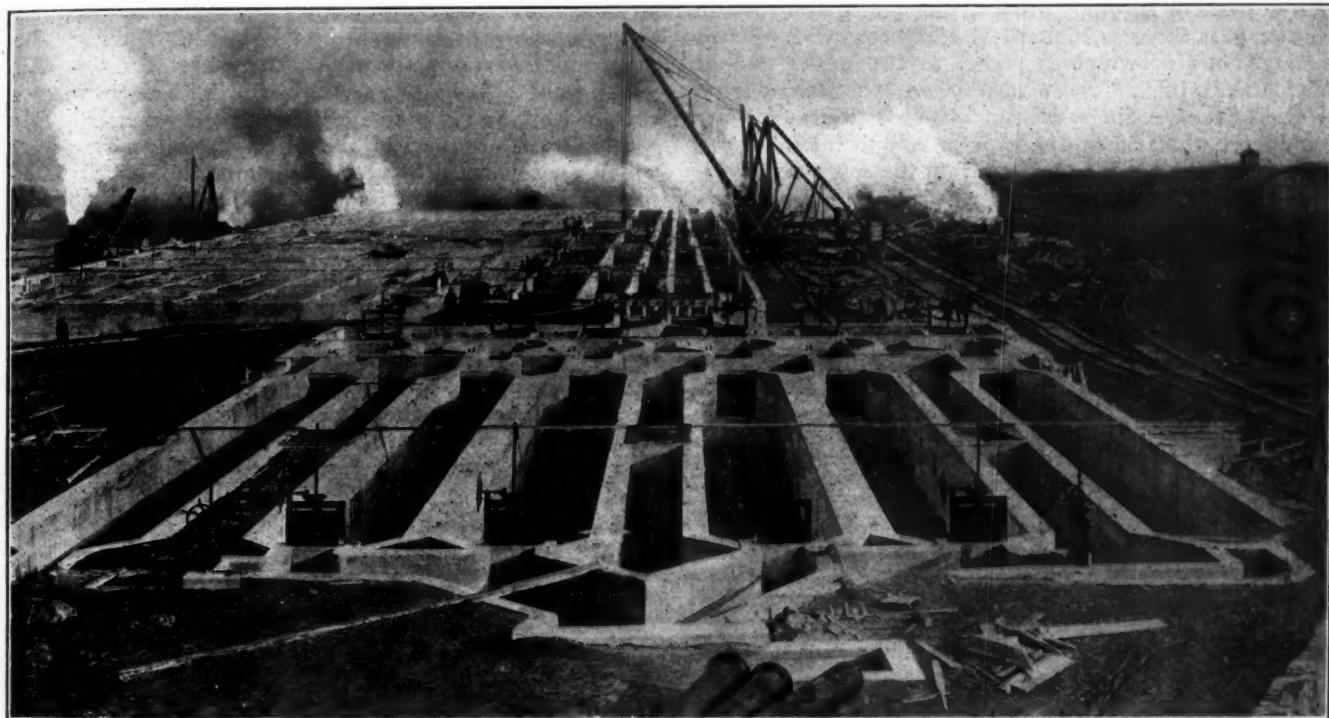


FIG. 1. GENERAL VIEW OF PLANT NEARING COMPLETION.  
Detritus tanks in foreground. Influent channels in middle background. Imhoff tanks at left. Sludge beds at extreme left.

Rochester, New York, is now bringing to a conclusion three projects of more than ordinary magnitude,—the construction of a third line of conduit from Hemlock Lake, the source of its water supply; the deepening of its river to provide against floods; and the construction of a sewage treatment plant. The last named has been referred to several times in Municipal Journal, and a fairly complete description of the plan as proposed was given in our issue of December 18th, 1913, and a progress description and illustrations in the issue of December 16th, 1915.

There are two sewage treatment plants for the city, one serving a comparatively small area which has been in operation for a number of months, and a larger and the principal one which is now about completed. This large plant consists of six detritus tanks, each with a Riensch-Wurl screen, the effluent from which passes to Imhoff tanks, and the effluent from these to an outlet into Lake Ontario, a fall in gradient in this outlet being utilized to

create power. In addition there are sludge drying beds and a chamber is provided for disinfecting the sewage if this shall be required by the State Board of Health. The complete plans provide for twenty Imhoff tanks, ten on each side of a group of central conduits, but only the ten on one side, with their accompanying sludge beds, have been constructed at the present time.

In connection with the construction of the treatment plant, it has been necessary to provide intercepting sewers and an outfall sewer. The sewerage of the city is on the separate system, and the intercepting sewer has been designed to carry all of the dry-weather or house sewage and, in addition, two and one-half times this amount of storm water. When the flow exceeds three and one-half times the dry-weather flow, the surplus (which will, of course, be a mixture of storm water and house sewage) will pass directly to the river through the original sewers, with which the interceptor is connected. The dry-weather flow is calculated as the sewage from an estimated future

population of 390,000 (which is about double the present population tributary to this plant), on a basis of 120 gallons per capita, which is about 30 per cent greater than the present per capita flow.

Each of the six detritus tanks contains a settling chamber ten feet wide and ninety feet long and with an effective depth of three feet, which extends practically the entire length of the detritus tank, in the middle of its bottom. It is proposed to clean these settling chambers by use of an excavating machine which will have three lines of buckets and which will discharge the material removed onto a belt conveyor, which in turn will deliver it to dump cars. This excavating machine will travel on tracks placed on the walls between the tanks (all six tanks being located side by side in one group) and travel by its own power to and along any of the tanks. The material so removed will be used, as will also the sludge from the sludge drying beds, for filling in low land adjacent to the disposal plant and within the 290 acres which is owned by the city. It is proposed to operate these tanks in such a way as to give the sewage within the tanks a velocity of 8 to 15 inches per second, the velocity being decreased as the amount of grit carried by the sewage increases.

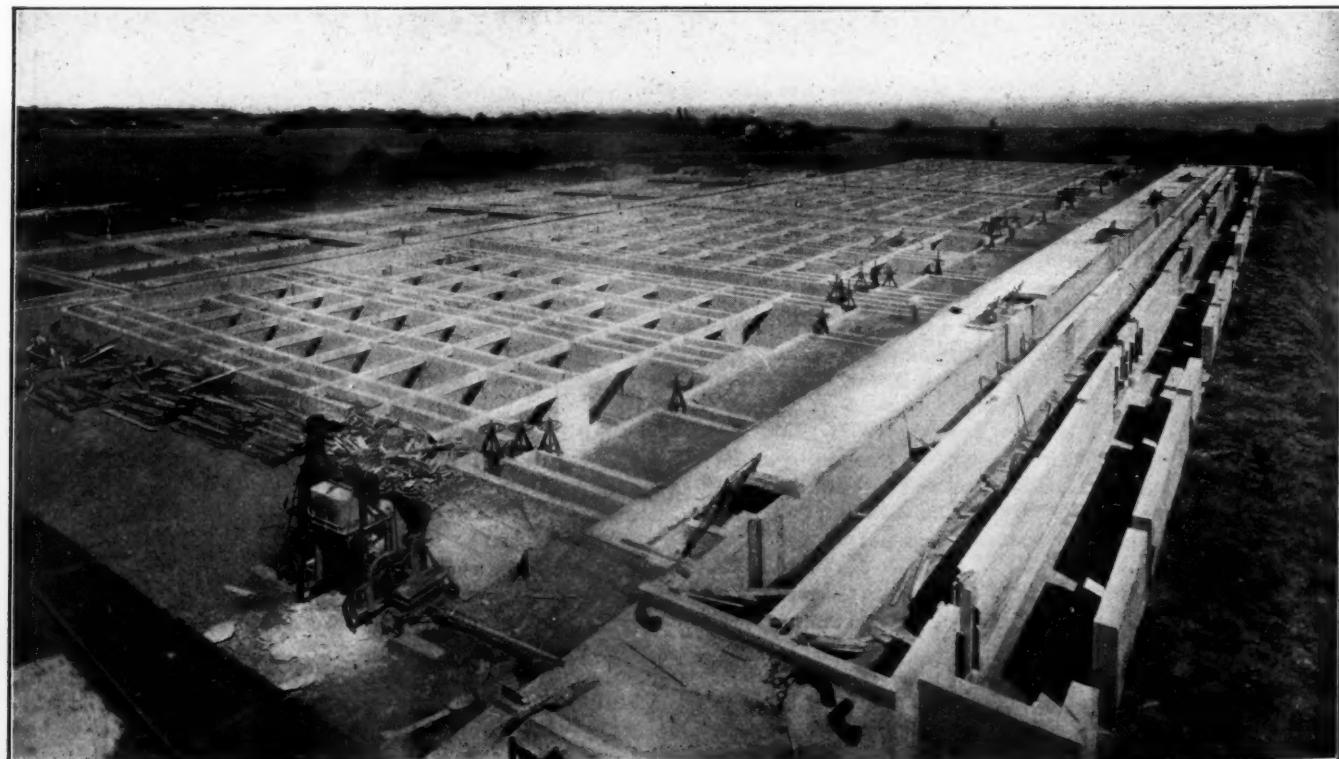
After passing through the detritus tanks, the sewage will then pass through Riensch-Wurl screens with  $\frac{1}{4}$ -inch openings, one of which is placed at the outlet end of each detritus tank. These screens, as is apparent from the size of the openings, are not intended to produce any high degree of clarification, being merely to remove some of the larger suspended matters from the sewage.

From the screens the sewage will pass to the channels that distribute it to the Imhoff tanks. The plan provides for two channels, one for each set of ten tanks. Although only the tanks on one side of these centrally located conduits are being built at the present time, the conditions connected with the construction seemed to make it advisable to build both sets of conduits. These influent channels pass across the ends of all of the tanks, a distance of about 485 feet. Each channel is level on the bottom, but

decreases in width as it approaches the further end, the width opposite the last tank being two feet. The variation in widths is designed to give a uniform velocity throughout the entire length of the channel and at the same time provide for the withdrawing, opposite each tank, of the sewage which is to be treated in that tank. The object is to maintain a minimum velocity of two feet per second in these channels, thus avoiding any considerable amount of deposit therein. The diversion of flow from this channel to each of the Imhoff tanks is controlled by a gate in the wall of the channel, which gate is operated automatically by a float (in a chamber connected with the influent channel) connected to one end of a walking-beam, to the other end of which a counter-weight is attached, the gate being attached to the same arm of the walking-beam as the float, but nearer the fulcrum. The ratio of the distances between fulcrum, float rod, and gate rod can be adjusted so as to regulate the amount of gate opening. The relation between rise of water in the effluent channel and amount of gate opening will, of course, vary with the different tanks, the object being to so regulate them that each of the tanks will receive the same amount of sewage, no matter how the total amount may vary.

In some respects these Imhoff tanks differ from the majority of those previously constructed in this country. One of these is in the fact that, except for the hopper bottoms (of which there are three in each tank), walls of the tanks are all vertical. The entire area occupied by the tanks was excavated, and practically this whole area is occupied by the sludge digesting chambers, which are separated by vertical concrete walls, instead of the more ordinary practice of building each tank in an excavation of its own. As no subsoil water was reached by even the maximum depth of excavation, this introduced no difficulties.

The settling compartments of each tank consist of two self-supporting flumes or channels passing through the center of the tank and leaving a  $2\frac{1}{2}$ -foot gas opening between each outside wall and the flumes, and a  $3\frac{1}{2}$ -foot gas opening between the flumes themselves; the combined



Courtesy Rochester Evening Times.

FIG. 2. INFLUENT CHANNELS AND IMHOFF TANKS. SLUDGE DRYING BEDS AT EXTREME LEFT.

areas provided for gas opening being about 30 per cent of that of the entire tank. The bottom of each settling channel has the ordinary double slope and inverted V-beam construction. This gives an unusually large sludge digestion chamber, providing storage for a period of 150 days, which might at times be required by the cold weather which is experienced in Rochester. The settling channels are made smaller than in a number of plants, because it was believed that a shorter period of sedimentation was required for the Rochester sewage. The unusually ample provision for escape of gas also will be noticed, which is undoubtedly an excellent feature of the plant.

The velocity in the settling channels will be .023 feet per second during dry weather, but when the maximum of storm water is reaching the plant, this rate will be increased to .072 feet per second and the height of water in the channels slightly increased. The time during which the sewage flows through the tank will ordinarily be 78 minutes, which will be decreased to 25 minutes during the heaviest storm flow. This comparatively short period for sedimentation is believed to be justified, partly by the removal of lighter floating matters by the screen, but chiefly because the effluent is to be discharged into the lake at a long distance from shore, and extreme clarification is therefore considered unnecessary.

Each tank is 110 feet long and 35 feet wide, and has a maximum depth of 40 feet. Each settling channel is 10 feet wide and 14 feet deep, or 12 feet deep from the water surface to the bottom slot. The slope of the bottoms is 8 to 11. The tanks are built in pairs, the central dividing wall carrying the sludge channel. Each pair of tanks is separated from the next by a 10-foot driveway. The walls are connected at intervals of 12 feet 4 inches by 18-inch concrete walls, which walls serve as beams to support the settling channels, and also as combined braces and ties for strengthening the walls, each containing tie rods which are connected to steel channels built into the tank walls. The tanks are made symmetrical with respect to their middle lines, and channels are provided for each pair so that the sewage can be applied at either end of any tank and discharged at the other end, the direction of flow being controlled by gates operated by hand.

The effluent from these tanks is discharged into a main effluent channel, which is constructed parallel to the influent channels, but at a lower level. This effluent channel is divided into two channels by a low longitudinal wall, which acts as a weir. The smaller of these two channels has capacity for carrying the dry-weather flow. When this flow is exceeded it overflows into the larger channel. These channels increase in width as they approach the outlet, in order to provide for the several increments of effluent received from the successive tanks. The smaller of these two channels discharges directly into a 48-inch pipe, which leads to the power plant; while the larger discharges the storm overflow directly into the lake.

At the power plant the available head is utilized for producing 150 h. p. by means of two turbines, each of which is directly connected to generators. The resulting power will be used to operate the several mechanical features of the plant and to light it.

Sludge is withdrawn from the sedimentation tanks by the ordinary method of utilizing hydrostatic head to force it through pipes extending from the bottoms of the digestion chambers to sludge channels which are five

feet lower than the water surface in the tanks. These channels convey the sludge to sludge drying beds (seen at the extreme left in illustration No. 2). These beds provide one-third of a square foot of area for each person contributing sewage, or a total of a little over 1½ acres. The beds are divided into sections about forty-three feet square. The filtering material consists of two inches of fine sand on three inches of coarse sand, this in turn on eight inches of coarse sand and gravel, which is supported by six inches of broken stone. Under the whole are placed lines of three-inch tile, spaced eight feet apart. Walls running lengthwise of the beds carry tracks on which are run dump cars, by which the sludge will be removed. It is proposed to load the cars from the drying beds by use of buckets which, when loaded with dried sludge by hand-shoveling, will be carried to the cars by conveying machines.

Owing to the construction of the Imhoff tanks in one large excavation, as described, most of this was removed by use of a steam shovel; the hopper bottoms, however, being rough dug with a clam-shell bucket and trimmed to exact surface by hand. The concrete for the tanks was delivered to place by four traveling derricks with 80-foot booms, the concrete being brought to the derricks by cars from a central mixing plant located about 500 feet from the tanks. Standard gage tracks surrounded the tanks and connected the various parts of the work with each other and with the railroad siding, by which all materials were delivered on the site in car-load lots.

There were no vertical construction joints in any of the tanks, but in each unit a horizontal section about three feet high was made at one continuous pouring in the forms. While this was setting a continuous pouring was made in the forms of the adjacent unit. The forms of the first were then raised and the next horizontal section of concrete added. In joining these horizontal sections a key-way was placed in the top of each pouring, and great care was used to thoroughly clean the top surface of all dirt, loose material and laitance before beginning the next pouring. Six pounds of waterproofing substance was added to each cubic yard of concrete in a further effort to make the tanks water-tight.

The entire construction work has been under the supervision of C. A. Poole, general assistant in the Department of Engineering. Myers & McWilliams of Rochester were the contractors. The plant was designed under the supervision of E. A. Fisher, until recently city engineer and now consulting engineer for the city, with whom Emil Kuichling (who died a few months ago) was associated as consulting engineer.



Courtesy of the Dallas News.

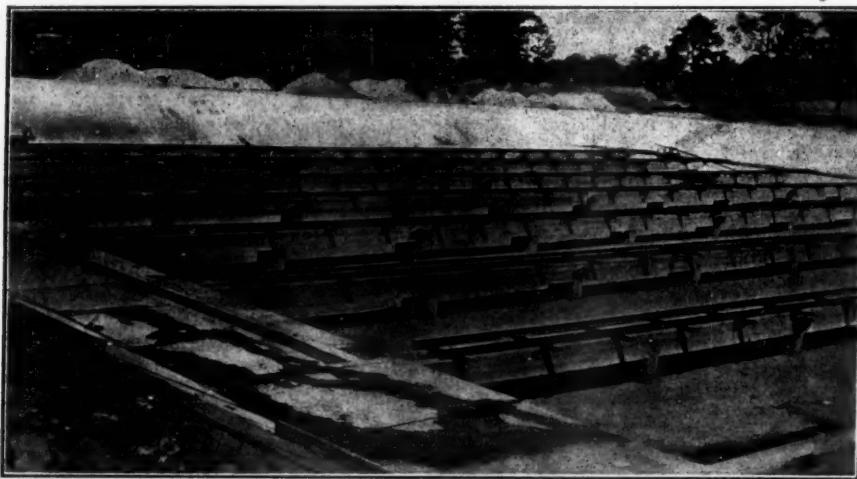
DALLAS IMHOFF TANKS UNDER CONSTRUCTION.

**DALLAS SEWAGE TREATMENT PLANT.**

A new sewage treatment plant for Dallas, Texas, together with intercepting sewers and pumping station, was formally placed in operation on January 4th, work on the plant having been begun in February, 1915. The new work consists of three intercepting sewers and an outfall sewer, a pumping station with a capacity of fifty-one million gallons per day distributed among three pumping units, a force main and a sewage treatment plant.

The intercepting sewers range in size from fifteen to fifty-one inches in diameter. All of these lead the sewage from the several sections of the city to a pumping station at the river, the sewage from one section passing under the river through an inverted siphon which discharges directly into the pump well. From the pumps the sewage is forced through a concrete force main thirty-six inches in diameter and 14,300 feet long to the sewage treatment plant, which is located three and one-quarter miles south of the business district on the west bank of the Trinity river.

Here is located a plant consisting of grit chambers, twelve Imhoff tanks, sprinkling filters, secondary Imhoff tanks and sludge beds. The Imhoff tanks are thirty-three feet deep. From them the sewage passes through thirty-inch cast iron pipes to the control chamber of the sprinkling filters, from which it is distributed to the various parts of the filter beds. From the sprinkling filter the sewage passes to secondary Imhoff tanks, and from these to the river through a four-foot concrete



Courtesy of the Dallas News.

**SLUDGE BEDS, DALLAS SEWAGE TREATMENT PLANT.**  
Concrete beams support tracks for cars removing dried sludge.

conduit. The sludge from the Imhoff tanks will be drawn off upon sludge beds of gravel and sand, and when dried is to be used in filling up low lands along the river.

**COMFORT STATIONS FOR PUBLIC ROADS.**

The suggestion made some time ago by the Pennsylvania Highway News and reprinted in Municipal Journal, that rest houses be provided on public highways, is now being advocated by a Public Comfort Station Bureau, backed by the American Automobile Association, National Highways Association and other national bodies, and a nation-wide campaign has been started to secure roadside public comfort stations in cities and elsewhere along highways.

At present the motor-traveling public, although they form a considerable percentage of the population, is largely dependent upon private kindness for such accommodations. The aim is to secure, in every city through which a main highway runs, one or more public comfort stations provided with a comfortable waiting room, sani-

tary toilet accommodations, drinking water and, in hard water localities, a small apparatus for supplying soft water for automobile radiators; also a long-distance telephone.

Where cities are far apart, as in the west, counties or townships will be looked to for these accommodations, the idea being to have community buildings containing auditoriums where lectures can be delivered, halls where dances can be held and where rural companies of state militia or national guards can be drilled and quartered.

In order that features that would be of value in case of war may be incorporated in the buildings, the War Department has detailed Major Carl F. Hartman to cooperate in the work.

Such a station as is contemplated would cost approximately \$10,000, with less expensive ones for the small towns. It is hoped to make the stations self-supporting and even to recover the cost of construction in about ten years, by leasing privileges therein.

**REFUSE DISPOSAL IN CALIFORNIA****Dumping Garbage and Rubbish in Oakland—Preventing Fly and Other Nuisances—California Engineer's Views on Incineration.**

In discussing the subject of refuse disposal before the League of California Municipalities, Percy F. Brown, city engineer of Oakland, Cal., gave considerable information as to how this matter is handled in his city. He stated that Oakland disposes of its garbage and refuse by making a fill along the shore. The city has enclosed by a levee about a mile from shore an area that is submerged and yet is fairly convenient to the center of the city.

The mixed refuse is taken to this enclosure in the collecting wagons and dumped from a bank, the face of the bank being kept high and steep rather than placing the refuse in layers. This face is kept about 300 feet long. An effort is made to keep at the top of the dump loads that have a large proportion of paper. In this way a fill about ten feet deep is made, which settles probably two feet in the course of a month. This fill becomes hard enough to permit wagons to pass over it without trouble, except near the face, where the fresher material is found and here they are helped with an extra team. Three men and a teamster handle about 140 tons a day at a cost of about

ten cents a ton for labor. Including the upkeep of the roads and the building of the bulkhead, the total cost last year approximately seventeen cents a ton. Examinations made of portions of the dump four months old showed that decomposition had taken place to a depth of about a foot. It is assumed that decomposition will take place more slowly than it would on dry land, partly because it is in salt water and partly because sand is pumped over the fill to a depth of about four inches by a hydraulic pump, the entire dump at the same time being flooded with salt water. There apparently is no odor from the dump, although there is some nuisance from the carts carrying the garbage there.

The city has previously had trouble with fires starting in dumps, which it was difficult to get under control, and it is not permitted to burn any material on these dumps. In order to meet the difficulty presented by rats in garbage dumps, the rat-tight fence is suggested as a remedy. But so far this has not had to be applied at the Oakland dump. Flies, however, have given some trouble, or rather

threatened trouble, which has been averted by the means adopted. With the beginning of the first warm weather after this dump was started, flies were found breeding in great quantities in both old and fresh garbage, although Mr. Brown was of the opinion that the larvae were brought in with the fresh garbage. A formaline solution is used for killing the larvae and in addition an effort is made to prevent wagons from bringing back to the city flies, which, in spite of the precautions, are more or less abundant at the fill. A pumping plant has been provided, and also a tank which the pumps keep supplied with salt water, and the scavengers are required to wash their wagons with this salt water before leaving the grounds; which precaution seems to prevent any trouble from flies returning with the wagons. That portion of the dump which is six months old, with its covering of sand pumped from the ocean, is hard and has no objectionable appearance whatever.

"A good foreman will do more toward keeping a dump from being objectionable than almost any amount of science. I do not believe that sorting should be allowed on the dump. There is a tendency to allow this on all dumps, but the amount of material that is saved, while considerable, is not attractive. It goes back into the city to be sorted, and no doubt is objectionable from the standpoint of health." One feature which probably assists in preventing this dump from being a nuisance is that every load contains refuse as well as garbage, and in each load there is less of kitchen refuse than of paper and other dry refuse.

#### IN SAN FRANCISCO.

In discussing this subject, M. M. O'Shaughnessy, city engineer of San Francisco, made several statements which are more interesting than flattering or encouraging to the manufacturers of incinerators. Among these were the following: "The art of incineration of city refuse has not yet passed the experimental stage. \* \* \* There are very few, if any, incinerating plants in the United States that are giving the satisfaction that was predicted for them before they were built and put into operation. \* \* \* An essential consideration that most of the designers have overlooked is that a furnace which gives satisfactory results under a certain definite combination of physical conditions may, and most probably will, prove entirely unsatisfactory when one or more of these physical conditions are changed. \* \* \* It is not a matter of pride that, out of one hundred and eighty incinerating furnaces erected between 1885 and 1908, no less than 102 had been dismantled or abandoned before the end of the year 1908. This furnishes no conclusive evidence against the efficiency of the American type of furnace, which English engineers are so fond of criticising, but it argues a lamentable lack of study of the local conditions, to meet which these incinerators were designed. It is admitted that, with the addition of sufficient fuel, garbage of any description can be destroyed without offense. Here, however, is introduced another vital consideration, namely, the cost of disposal.

"For ordinary incinerator plants with a capacity of say 100 tons per twenty-four hours, the labor cost for burning should not exceed fifty cents per ton. Collection costs may vary between \$1.50 and \$2.50 per ton, so that a fair average total cost of collection and disposal will be in the neighborhood of \$2.50 per ton. Generally speaking, the larger the plant and the nearer it is located to the center of population, the less will be the total cost of disposal."

Concerning the generation of steam from refuse, Mr. O'Shaughnessy stated that some of the modern destructors will evaporate one ton of water in the boilers for each ton of total refuse burned, "but unless this steam can be profitably disposed of, its generation is useless. Since the temperature in the furnaces is unsteady, the power

output likewise fluctuates. Unless the steam can be used to supplement peak loads or some continuous source of steam supply, its generation during the process of incineration is seldom economical."

## PLANNING WATER SUPPLY MAINS

#### Calculation of Sizes and Times for Laying Two or Three Mains at Intervals, So As to Make Total Cost a Minimum.

In designing a water supply system, a large part of the mains, and especially the larger ones, will be found to serve a district in which the population and consequent consumption may be expected to increase for some years to come. It then becomes a problem to the engineer how much provision should be made for future growth in determining the size of each main. If he endeavors to make the original construction adequate for fifty or one hundred years to come, this size will be much larger than is necessary for present requirements and a considerable part of the cost of constructing it will therefore return no adequate service for many years to come, and the interest on the additional amount so spent might better be saved.

On the other hand, if the size of the pipe adopted is such that its capacity will be reached in a few years, another duplicate main must then be laid, and the cost of these two will be considerably greater than that of a single main having the capacity of the two combined. From this financial point of view, the problem presented is that of so constructing an original main and a supplementary main or mains as they are needed, that the total ultimate cost, including compound interest, will be a minimum.

This financial consideration is not the only one, however, since there is the advantage in laying only one main which will suffice for all time, that further disturbance of the street for laying the additional main or mains is to be avoided, that there will never be more than one main to keep in repair, and that there will be the joints of only one main from which leakage may occur, instead of the two or three mains by the addition of which the number and amount of leaks would probably be considerably increased. On the other hand, where one or two additional mains are to be constructed at intervals of twenty or thirty years, an opportunity is offered to lay the new main along a new route so as to more effectively serve the district in case the direction of growth or location of large consumers (such as manufacturing plants) should produce conditions different from those originally anticipated. In fact, the growth anticipated for this district might not take place at all, and it might be found unnecessary to provide the total capacity which it was originally thought would be necessary.

These possibilities must be borne in mind; the decision as to the weight to be given to each of them will depend upon the judgment of the engineer.

Considering merely the financial question above referred to, we propose to suggest a method of solving this which will give a positive and definite answer. The solution as given below in detail is more elaborate than will generally be necessary, several calculations being introduced which an engineer, after a little experience, would know beforehand would be unnecessary.

In the first place, a calculation is made of the smallest pipe that will serve the district at the present time, assumed in this case to be a 10-inch pipe and that this will suffice for five years to come. The additional assumption is made that the increase of consumption will be at the general rate of 30 per cent each decade (the rate

in each case should be based upon a study of population statistics); and that at the end of fifty years the district will have obtained its maximum intensity and rate of consumption and that thereafter the consumption for the district will remain practically constant.

On this basis we have a table as follows:

For 5 years to come, capacity required that of 10-inch pipe, costing \$1.25 per ft.  
 Capacity required at the end of 20 years, that of a 12-inch pipe, costing \$1.55 per ft.  
 Capacity required at the end of 30 years, that of a 14-inch pipe, costing \$1.93 per ft.  
 Capacity required at the end of 40 years, that of a 16-inch pipe, costing \$2.30 per ft.  
 Capacity required at the end of 50 years, that of an 18-inch pipe, costing \$2.72 per ft.

The prices given opposite each size of pipe are those assumed to be the cost per lineal foot of furnishing and laying cast iron water pipe of the sizes indicated.

This table indicates that if a 12-inch main be laid at once, it will serve for twenty years, when additional capacity must be provided; similarly, that a 14-inch main would suffice for thirty years, a 16-inch main for forty years and that an 18-inch main would have sufficient capacity for all time—at least as distant a future as it seems desirable to provide for.

Another table is then prepared showing the various combinations of sizes and periods by which the continuously increasing consumption of the district may be provided for; the table in question showing ten different combinations. For instance, the first combination provides for a 10-inch main, which would continue in service

**Combinations of Mains Possible to Meet Consumption Requirements.**

Figures Indicate Number of Years Each Main Will Be in Service.

Combina- tion No.	Sizes of Pipe						Total cost per ft. of combined lines at end of 50 yrs., int. at 4%.
	8 in.	10 in.	12 in.	14 in.	16 in.	18 in.	
1.....	..	50, 45	20	..	..	..	\$19.57
2.....	..	50	..	..	45	..	22.31
3.....	..	30, 15	50	..	..	..	17.32
4.....	..	..	50	30	..	..	18.27
5.....	..	..	50, 30	..	..	..	17.27
6.....	30	..	50, 20	..	..	..	17.65
7.....	..	..	20	50	..	..	17.11
8.....	5	20	..	50	..	..	17.68
9.....	..	10	..	..	50	..	18.20
10.....	..	..	..	..	..	50	19.33

during the fifty years in question, being augmented by another 10-inch pipe at the end of the first five years, which second pipe would remain in service for the remaining forty-five years. At the end of the thirteenth year it will be found that the capacity of the two 10-inch pipes has been reached and another pipe must be provided, and it is found that a 12-inch pipe added at this time will furnish the capacity necessary to the end of the fifty year period, this 12-inch pipe thus being in service twenty years.

No. 2 shows another combination in which a 10-inch pipe is laid first and then five years later a 16-inch main is laid, this furnishing all the capacity required for the remainder of the period. Combination No. 3 shows a 12-inch main laid at first, followed by a 10-inch main twenty years later and another 10-inch main fifteen years after that. With this explanation, the remaining combinations are easily understood.

For calculating the total cost there are two or three methods available, such as a calculation of the annual payment or annuity to be paid each year during the fifty

years in order to meet the cost of the several pipe lines; or a calculation of the total cost, with annual compound interest, of the several pipe lines at the completion of the fifty-year period. The latter is simpler and is probably as accurate as the general conditions affecting the problem warrant, and is the one suggested for use. The rate of interest charged will naturally be that which would be paid upon bonds issued in raising the funds by which the pipe lines are constructed. Using a table of compound interest with interest at 4 per cent, and the figures given in the second table above, we find that the total cost at the end of the fifty years of the three pipe lines laid according to combination No. 1, will have totaled \$19.57 per foot. Similarly, the total cost of each of the other combinations will have been that shown in the right hand column of the table.

From this table we learn that the cost per foot of the several methods shown varies from \$17.11 to \$22.31—a difference of about 30 per cent. Several of the combinations differ very little in cost, four of them lying between \$17.11 and \$17.32. It will be noticed that each of these consists in laying in the first place a main having a capacity sufficient for approximately twenty-five years, and that the highest totals occur when the smallest possible main is laid at the outset; except for the single case where a main of the ultimate capacity is laid to begin with, and even this does not cost as much as combinations Nos. 1 and 2, where the small main is laid at first.

The costs being so near together of cases three, four, five and seven, the choice should apparently be made from one of these. It would probably be thought desirable to omit those in which three lines of pipe are involved, since this adds unnecessarily to the objections to multiple lines referred to above. This leaves us cases four and seven to choose from, each involving one 12-inch and one 14-inch line. It being found to be somewhat cheaper to lay the 14-inch first, to be followed by the 12-inch, and this also giving for a longer period the advantage of the larger capacity, this would seem to be the most desirable procedure.

In this table it will be noticed that an 8-inch line is introduced in order to fill out the capacity where combinations of two given sizes do not quite meet this; but as the use of this small pipe in each case involves the laying of three lines, it would not generally be desirable to consider it, and it was introduced in this table only to make more complete the total statement of combinations possible to meet the capacity conditions.

It must be noted that these particular figures are based upon assumed costs of the different sizes of pipe and an assumed rate of interest of 4 per cent. With a different rate of interest, somewhat different results would be obtained; and if the cost of the different sizes of pipe did not vary in the same proportion as that assumed, this also would change the results. It is believed, however, that the ratio of costs is approximately correct for pipes of the same class, at the same cost per ton, and laid in trenches of similar depth and other conditions.

While this may seem more elaborate a calculation than some engineers are in the practice of making for designing individual lines of pipe, as a matter of fact an entire calculation such as this can be made in twenty or thirty minutes, provided that the assumptions as to present and future water consumption in the district and cost of different sizes of pipe have already been made, which of course should be done in preparing any plan for a water-works distribution system. Also, as stated above, part of the calculation may be omitted, such as the introduction of small pipe, or such a combination that a supplementary line will be required within ten or fifteen years of either end of the 50-year period.

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## DUMPING CITY REFUSE.

It is possible to deposit garbage and refuse mixed, or even garbage alone if properly treated, on low land without creating a nuisance. Dumping mixed refuse is apparently being done by Oakland, Cal., in a satisfactory manner, as described elsewhere in this issue. But at least two matters must be carefully considered in this connection—that the organic matter in the dumps may become objectionable from a sanitary point of view at any time for many years to come, and that it will not furnish a stable foundation for any structures for several decades.

The garbage in the dump must undergo decomposition ultimately. This may be putrefactive, and probably will be if at such depth that air cannot reach it; but the putrefactive decomposition may be so slow that any offensive gases that may be created are absorbed or dissipated without giving offense. But should dwellings be constructed on such dumps, the presence of decomposing garbage under and around the cellars, which may offer the easiest outlet for gases forming in the garbage for a considerable radius, is not to be contemplated with pleasure or confidence.

Fully as certain is the unsatisfactoriness of such a fill as a foundation for buildings. Garbage continues to settle for years, and such articles of rubbish as sofas, mattresses, boxes, tin cans, etc., will leave considerable vacancies when they finally collapse. A building that is founded on piles driven down to a solid stratum is not affected by this, but its cellar floor is and the walks and driveways around it, unless these also are supported by piles, which would be expensive for any but most extraordinary conditions.

If, however, the land so made is used for parks or other purposes that do not involve digging into it or founding

expensive buildings upon it, and the top is covered with two feet or more of soil in which vegetation will grow and which contains no objectionable matters, this disposal of the city's refuse may offer the most satisfactory solution of the problem.

But even if to be used as open land, the dumping should be looked after carefully, both to avoid present nuisance and to see that the garbage and refuse are well mixed, that boxes, barrels, etc., are broken up or removed and burned, tin cans flattened out, and general precautions taken to prevent any voids which will later result in local settlement. The deeper the fill of refuse the greater the probable amount of future settlement and the more distant the time when the decomposition will cease.

## ENFORCING SANITARY LAWS.

The law frequently disclaims any intention (or at least the courts do) of correcting injustices or remedying the effects of evil deeds. It confines itself to punishing the evildoers, and gives no thought to the parties wronged by them. If a poor man has his overcoat stolen in December and the thief is captured with it in his possession, the owner may not have his coat returned until the case has been finally disposed of, which may not be until the following summer; during the meantime the coat is held as evidence and the owner shivers. If a man will not support his family, he is put in jail. That does not help his family, to be sure; but the apparently sensible solution of putting the non-supporter to compulsory labor and giving his earnings to his family can not be adopted—it is not legal.

Some methods of enforcing sanitary laws are equally unhappy in that they fail to correct objectionable conditions. A certain city in a neighboring state, because the taxpayers would not vote the funds (a larger sum than they have ever voted for any other purpose) for building a sewage treatment plant, is prevented by the state board of health from laying a foot of additional house sewer. As a result new houses that have been put up by the score have no sewer connections, but must use privies or cesspools. The pollution of the river is not diminished, and the sanitary condition of the city grows worse every month.

Northern cities are apt to display a feeling of superiority to southern ones because of the much larger proportion of houses in the latter that are not connected with sewers, and the consequent high typhoid rates. But here we have a state that inflicts the inhuman punishment of compelling the same kind of insanitary conditions and thus probably adding to the typhoid toll in the recalcitrant city. On the other hand, Alabama courts have dealt with a somewhat similar case in an entirely different spirit. The large percentage of unsewered houses in Birmingham is believed to have been chiefly responsible for a typhoid death rate of about 50 per 100,000. Efforts of the health board to persuade all owners to connect with the sewers proved ineffective. But the state legislature passed and the courts have upheld a law aimed, not at punishing the offenders, but rather at remedying the evil; and Birmingham can now order an owner to connect his building with the sewer, and if he refuses to do so the city can make the connection and levy the cost against his property—a solution so direct and sensible that the only wonder is that the general principle is not universally adopted.

Why could not our northern states follow a similar course? If a city will not correct insanitary conditions that offend its neighbors, let the state have power to perform the necessary work and compel the city to pay for the same in the same way that state taxes are collected.

Some cities are actually prevented by their debt limits from doing work ordered by the board of health. In such a case the state could perform the work and permit the repayment by the city to extend over a number of years.

The attitude toward the problem in some states should change. Punishment for refusal to obey justifiable orders of the health board should be made to occupy a position of very inferior importance as compared to the securing of the results aimed at by the orders, if not in one way, then in another. The important matter is not upholding the dignity or authority of the board, but rather effecting actual results in securing improved sanitary conditions.

#### SAND FILTER AGITATION BY ENTRAINED AIR.

A method of prolonging the service periods of rapid sand filters and reducing the amount of wash water required, applicable under certain conditions, was described recently in a paper by J. W. Ellms and S. J. Houser, superintendent and chemist, respectively, of the Cincinnati filtration plant, before the American Chemical Society. This paper gave a description of results obtained at that plant last fall.

During each summer and fall, micro-organisms in the Ohio river water cause a heavy colloidal coating on the sand beds which, while it increases the resistance, also makes it possible to increase the loss of head to 10 or 12 feet and still produce an effluent of high quality. When so operated, air is carried into the filter in the water and there liberated, and collects in the sand. When the effluent valve of the filter is closed, some of this air escapes at the surface of the filter, loosening up the clogged sand. It was found that this agitation of the sand decreased the loss of head from 10 feet to 5 or 6 feet, and increased the period of service by about 10 per cent; and if performed three times, the length of service between washings could be increased about 30 per cent.

This length of service was still further reduced by slowly admitting to the filter a little filtered water through the wash water valve. This resulted in forcing out all the air in the filter and an additional effect due to the water rising through the sand. Following such treatment, the lost head dropped to within a pound or two of that which follows a regular cleaning, and by three such agitations, each effected when the head reached 10 or 11 pounds, the service between cleanings was increased more than 250 per cent. The water thus admitted to the bed was not wasted, but was drawn off with the filter effluent. About 5,000 gallons was admitted each time, about one minute being consumed by its entrance. (The average amount of wash water used per wash is 60,000 gallons.)

A record of runs before and during this treatment, August 27 to September 16, is given below, the method described above being begun on Sept. 3. Periods of service, hours: 23.2, 22.7, 18.5, 12.2, 9.6, 7.3, 5.8; (Sept. 3) 17.7, 13.2, 11.2, 9.0, 10.4, 10.0, 11.7, 13.7, 15.8, 14.4, 15.0, 16.5, 16.2, 16.9. The rapid reduction in length of service period just prior to September 3rd was due to the increasing numbers of micro-organisms in the water. The lengths of periods after that date should therefore be compared with those of the day or two immediately before.

The saving in wash water was the most important feature of this method of operation. During 14 days of this operation there was saved, it was estimated, 68,773,000 gallons of water that would have been used for washing under the regular method, or three times the amount actually used. The percentage of wash water

used was 2.78, while it was estimated that 11.16 per cent would have been used by the old method.

"The agitation of the surface of the sand bed can probably be repeated until the recovery of the loss of head is not sufficient to warrant further operation of the filter. Care must be taken, however, that the sand bed does not become too heavily or too deeply loaded with organic matter, and that finally a thorough and efficient washing of the bed is absolutely essential."

The author states that the bacterial efficiency remained high. The figures given show the bacteria per c. c. in the effluent from filters to have varied from 6 to 14 before this method of operation was begun, and from 55 to 85 during regular operation by this method. The effluent during the latter period was treated with chlorine, 0.15 parts per million, which reduced the bacteria to between 6 and 32.

#### PRECISE LEVELING

##### Conclusions of Coast and Geodetic Survey as to Effect of Time of Day, Surface Slope, Wind and Other Conditions on Accuracy of Work.

Every city, or village which expects some day to become a city, should establish early in its history a series of permanent bench marks whose elevations are compared by a line of precise levels; and if there is available a Coast and Geodetic Survey bench mark, or any other reliable one by which the datum plane of the city in question can be connected with some state or federal datum, this is by all means desirable. And these bench marks should be checked every year or two and new ones added as needed; this also being done by precise leveling.

Some of the results and conclusions derived from a line of precise levels that was completed not long ago have been published by the United States Coast and Geodetic Survey and would be of interest in this connection. This line of precise levels was run along the Southern Pacific Railway from Brigham, Utah, to San Francisco, 891 miles long and containing 315 bench marks. One noteworthy feature of this line is that all of the work was done by one observer, this being believed to be the longest continuous line of levels ever run in the United States by one person. Also, for the first time, a motor-driven velocipede car was used by a precise leveling party of the United States Coast and Geodetic Survey for carrying the members of the party and their instruments. Another unusual feature was the excellent work done by the party, especially in view of the fact that this was the first time that precise leveling had been done by the instrument man in charge.

The average rate of progress was about seventy-five miles a month, the maximum progress in any one month being eighty-five miles. The cost per mile was \$11.90, this agreeing quite closely with the average cost of such work for a number of years previous—\$11.10 per mile. This cost includes the establishing of the bench marks, but not the cost of instruments. It also includes transportation to and from the field, including those of the chief of the party and recorder. It also includes allowance for the fact that the government allows one month's vacation a year with pay.

Following the instrumental field work, several months were occupied in the various calculations based thereon, by which the various allowances were made and the elevations determined. From the experience in the field and results of the calculations, the Coast and Geodetic Survey has drawn several conclusions concerning precise leveling. Among these are the following:

The average size of the discrepancy between a difference in elevation determined twice under different conditions, does not give a clear idea of the magnitude of the accidental errors which may be produced by certain conditions, as the custom is to make the length of sight as great as the conditions will permit. Therefore the extra length of sight may offset otherwise favorable conditions and give a large difference between two runnings of a section.

For sections run twice under different conditions, the average accumulated value of the discrepancy is greater for the sections with steep grades than with low grades, the direction of the running being ignored and only the actual difference in elevation between the ends of a section being considered.

On all grades, but more especially the steep ones, the difference in elevation determined in the afternoon is, on an average, greater than that determined in the forenoon.

On an average, a running during wind gives a greater difference in elevation than one during calm. The amount of this difference is somewhat greater for the steep than for the low grades.

On an average, a running when the sky is cloudy gives a larger difference in elevation between two points on a steep grade than a running when the sun is shining. For low grades there is practically no difference on an average between the runnings under the two conditions.

On steep grades the average accumulated value of the backward minus the forward running is positive. There is no accumulation for the low sections considered as one group.

For steep grades the probability is that the afternoon running gives, on an average, a result closer to the truth than the forenoon running. The afternoon running should be ended sometime before sundown. The running in wind probably gives results on an average closer to the truth than a running in calm.

While the data obtained from the survey seemed to justify these conclusions, yet they were so interrelated that it is impracticable to obtain reliable numerical values for the effect of any given atmospheric condition or set of conditions. From the above it would appear that an ideal time and condition for running precise levels would be an afternoon with a moderate wind and a cloudy sky. On level ground or ground with low grades it is not necessary to be so particular with regard to the relation between the weather conditions and the separate runnings, provided the two runnings of a section are made on different days; but on a steep slope it is best not to make observations in the early morning or the late afternoon. The reading of a wire on the rod should never be less than about two decimeters. Whenever part of a day must be taken for setting bench marks or computing, the forenoon should be used for that work and the afternoon for leveling, rather than the reverse.

## SOCIETY FOR STREET CLEANING AND REFUSE DISPOSAL OF THE UNITED STATES AND CANADA

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*General Offices:* Municipal Building, New York City.

The matter appearing in this department, in the issue of the fourth week of each month, is supplied by the Publication Committee of the Society for Street Cleaning and Refuse Disposal of the United States and Canada.

### MISSION OF THE SOCIETY.

The Society for Street Cleaning and Refuse Disposal of the United States and Canada aims to guide the thought and concentrate the effort to secure better conditions in street cleaning and refuse disposal methods. Through its conventions and publications the experience of each member is made to serve all members. Many will be saved the time and expense of experimenting with what others have

tried and discarded. At the exhibitions, held in conjunction with the annual conventions, tests of apparatus are made by committees of experts, whose reports are available to all members of the Society. Thus will the worthy be separated from the worthless and large sums now unavoidably wasted by municipalities, in costly isolated experimenting, be saved.

### CHICAGO PROBLEM AND METHOD\*

By A. W. Miller.<sup>†</sup>

The plan of washing off the sidewalks at night was inaugurated several years ago and has now become a necessary and regular part of the street cleaning operations. A two-horse wagon, equipped with an 800-gallon tank, moves along the curb while a man directs the stream from a two-inch hose thoroughly washing all dirt and dust from the sidewalk into the gutter. This work has been costing 22½ cts. per 1,000 square yards of walk.

The street cleaning schedules put into effect cover all permanent pavements throughout the city, the frequency of cleaning being determined by the kind and condition

of the pavement, density and kind of traffic, proximity of unpaved streets and alleys, class of people, location of public buildings, etc.

Last year the uniforming of section foremen (the men in charge of gangs cleaning streets) was effected. With this improvement the entire force is now in uniform. These men come in daily contact with the citizen, and the uniform establishes their identity at once, and renders the work much more effective. The section foremen are clad in dark gray; street cleaners in white; the garbage and ash force in khaki. The only force not in uniform is that at the loading station, where dirt is excessive.

In the downtown section, sanding and salting of pavements after a snow fall has been found advisable, and with several new sand spreaders we are enabled to treat all grades and approaches in a like manner.

Last year 198,303,557 sq. yds. of alleys were cleaned by the gang system, 203,715 cu. yds. of paper was burned with portable paper burners, 4,488,359,027 sq. yds. of

\*Paper read before convention of Society for Street Cleaning and Refuse Disposal, October 14.

<sup>†</sup>Superintendent Bureau of Streets of Chicago. Since this paper was read Mr. Miller has resigned as superintendent of streets, to assume duties of clerk of Circuit Court, to which he was elected in November.

streets cleaned by hand, 777,845 cu. yds. of street dirt removed, 39,905 cu. yds. of this dirt were hauled by street cars to the dump, 172,500 gals. of water used for sprinkling. This work cost 30 cts. per sq. yd. for cleaning and removing street dirt, or 56 cts. per capita.

We find that the horse-drawn flusher can be operated at a cost of about 15 cts. per 1,000 square yards, and the auto flusher at approximately 8 cts. per 1,000 square yards.

In the outlying districts the vacant property is an excellent field for weeds, and the bureau received only \$7,722.23 to carry on the work of weed cutting. Nevertheless, we cut 6,632,532 square yards of weeds along streets and in parkways.

The season of 1916 opened with 1,971 miles of paved streets and 206 miles of paved alleys calling for attention. There remains 1,206 miles of streets calling for improvement and 1,443 miles of alleys. The paving work is progressing at the rate of 150 miles per year, and it is needless to say that if appropriations do not show a like increase, we may face dirtier streets in the future. Last year's appropriation allowed \$58.19 per mile per month for street cleaning, but with the costs in Chicago, no intensive system can develop to any extent at that price.

One of the first difficulties that confronted me when I came into the department was a severe winter; 25.1 inches of snow fell, and this was the heaviest in many years, although it cost the city but \$86,300 for removal, a considerable saving over other years of lighter fall.

Our records show that we sweep 1,000 miles of street every day and employ 1,531 men to do this work. The wages paid are as follows: Laborers are receiving \$2.50

per day; section foreman, \$2.75; teams, \$6.00, and one-horse carts, \$4.50.

In the street cleaning appropriations we cannot expect much relief this year, for the corporate fund does not increase in the proportion necessary to take care of the city's development. We are sadly in need of additional machinery and tools, incinerators and reduction plants, auto trucks and tractors to lessen long hauls, and loading stations located centrally in the thickly populated districts. Finally, we will have to resort to the steam roads to carry the wastes away from the city into the low country. In all the new projects, such as the proposed fruit terminal, incinerators and loading stations should be provided. In the next election it will be our endeavor to have a bond issue created which will help us realize the fulfillment of our plans and desires for betterment. Just what success will be met with is hard to state at this time.

Chicago's condition at this time is, in my estimation, one of a very serious nature, and one that requires immediate action. Procrastination means that before we are aware of it, we will be practically tied up for a means of disposal of waste. The plans on foot by the Health Department are not yet realized and the two incinerators built by it are not sufficient to take care of the ever-growing problem.

#### MANHOLES FOR STREET CLEANING CANS.

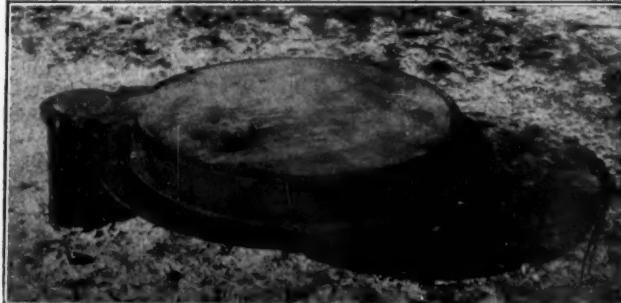
By A. RHODES, Street Commissioner.

The city of Worcester was fortunately the first city in the United States to place an order for a number of the new type of locking manhole tops, which has been recently developed by L. A. Ranshousen, of Springfield, Mass. This manhole top will be used in connection with a three-foot length of Akron sewer pipe, set on a 12-inch layer of broken stone, which will form a receptacle for street cleaning cans when they are full, or when not in use by the can carriers of the push cart men.

It has always been a very difficult matter here for us to find locations for the full cans and the extra empty cans that would not be obnoxious to the sight or because of litter either blowing around or attracting flies by their contents. The scheme we have in mind here is to place these receptacles at intervals in sidewalks, back of the curb line, each receptacle holding a cleaning can. Either these cans can be taken out from the receptacle and the full can inserted, or the full can may be dumped into the empty can already in the receptacle, and the push cart man go about his business with his empty can. The style of the top is a locking device which is operated by a "T" handle wrench, which the can man will carry hung on his can carrier.

The pick-up wagons will be equipped with an arm at the rear and a set of falls rigged to the arm, with a bale hook for lifting the cans out of the holes. The pick-up team will drive close to the curb, the cover will be removed, and the bale hook hooked onto the handles of the cans. (The cans will be designed with an inside handle instead of an outside handle.) The bale and falls adjusted, the can will be lifted to the can wagon and swung aboard, and the empty can will be left behind to take its place.

This, we figure, will give us a clean, sanitary arrangement for the cans, offensive to neither sight nor smell, with no opportunity for flies to be attracted, and the receptacles will be placed at intervals behind the curb in such position as to afford opportunity for the can man to deposit his material as he picks it up. The cover lifts with a partial turn of the handle and then swings around clear of the hole.



MANHOLE COVER FOR RECEPTACLES FOR STREET SWEEPERS' CANS, WORCESTER, MASS.

# The WEEK'S NEWS

The Needs of Pennsylvania's and New Jersey's State Highways—Philadelphia's Traffic Circuit Plan—Infantile Paralysis in the South—Toledo's Sewerage Plans—Fort Wayne's Polluted Water—Metering Springfield, O.—Utica's New Lighting Contract—Dallas Franchises—Two Platoons in New York City and Scranton—Fires in Rochester, Minn., Hillsdale, Mich., and Rock Island, Ill.—New Auto Apparatus—City Manager Plan Victories—Tax Troubles of Toledo and Lucas County—Cities of New York Join for Legislation—Snow Ordinance in Spokane—Butte's New Incinerator—New York City Employes Join Against High Cost of Living.

## ROADS AND PAVEMENTS

### Paving Law Upheld.

Lincoln, Neb.—The supreme court of Nebraska has upheld the law of 1915 under which Kearney and North Platte and other cities of the first class have issued paving bonds. An injunction had been asked for in the lower court to restrain the mayor and city council of Kearney from ordering paving on a street on which the plaintiff owns abutting property. The lower court dismissed the suit. The principal point raised was the alleged unconstitutionality of the paving law of 1915. The plaintiff alleged the original bill had been sidetracked in the legislature and later revised and its title changed and it was passed and signed by the governor. It was alleged the change in the original act made a new bill of it. It originally related to paving in cities of the second class and villages and cities of the first class. The legislature cut out that portion relating to cities of the second class, leaving it a bill applying to cities of the first class having from 5,000 to 25,000 population. While not passing on the policy of such legislation, the supreme court holds that the original title related to paving streets and making assessment therefor, and that this title gave notice that paving in general was the subject of legislation. The court says it will not hold an act of the legislature unconstitutional unless it is clearly so. The city of North Platte has issued \$20,000 paving bonds under the act of 1915 and will now present them to the state auditor for registration. The city of Kearney has issued a considerable amount under the same law and the state has bought about \$50,000 of the issue, some of them having been bought before the law under which they were issued was questioned.

### Report on New Jersey's Roads.

Trenton, N. J.—Suggesting a state highway system, with a total of 3,750 miles, including main roads, feeders and branches, at an estimated cost of \$34,290,000, to be expended in five years, the report of a special road commission named by Governor Fielder last winter has been submitted to the Legislature. The final report recommends that the state assume entire responsibility for the cost of the improvement of main highways, at an estimated outlay of \$28,000,000, and that the counties should finance the improvement and maintenance of the feeder and branch roads, at an estimated cost of \$16,290,000. Going into details as to how the financing should be done, the report sets forth how the commission expects the state to realize sufficient revenue within the five-year period to meet the expenditure that it would be called upon to shoulder. Briefly put, this would be in estimates as follows: Contributions from the Federal Government, \$888,200; appropriations from the general funds of the state, \$3,500,000; receipts from the motor vehicle license fees, \$9,660,000; receipts for five years from an annual tax of one mill on the dollar, or about \$15,000,000. The commission whose report was placed before the lawmakers was made up of the state road commissioner, Edwin A. Stevens, Joseph H. Wood, chairman of the committee on legislation of the Associated Automobile Clubs of New Jersey; John W. Herbert, member of the State Chamber of Commerce; Frank B. Ridgway of the New Jersey State Grange and Horace A. Bonnell, chairman of the committee on good roads of the Associated Automobile Clubs of New Jersey. The commission recommends that a state highway board be created of three citizens residing

in different counties and to be appointed by the Governor, with the consent of the senate. There would be no salary, but in addition to their "reasonable expense" a maximum of \$25 would be paid to the members for each attendance at meetings of the board. The widest discretion possible is suggested for the State Highway Board, so that what is considered as the first task, the scientific selection of routes for a comprehensive state highway system, could be accomplished, and then the taking over of suitable roads from the various governing bodies. Suggestions are contained in the report as to how the selection of routes should be made—that so far as practicable they should be connected and co-ordinated and coincide with existing roads and streets. As to what the various counties should do in the matter of financing their part of the highway improvement the report says that they should provide a fund for feeder or branch highways to be known as the "fund for the state highway system." None of this money should be spent for any other purpose than the improvement and maintenance of the roadways controlled by the counties. All the expenditure for this purpose, too, would be subject to the approval of the state highway board. The report says: "It is not too much to say that, even with the maximum of highway efficiency and economy, New Jersey will spend close to \$200,000,000 for highways during the next twenty-five years."

### The Philadelphia Traffic Circuit Plan.

Philadelphia, Pa.—The plans for a traffic circuit for the center of the city have not been abandoned, according to a statement by Mayor Smith, but merely postponed for legal reasons. The work of the comprehensive plans committee will continue and all details worked to completion so that when the time arrives the municipality may proceed without delay to a completion of the work. At the request of the mayor, an ordinance was introduced in councils some time ago to place on the city plan the ground necessary for the proposed circuit. Advice from City Solicitor Connelly, stating this action would impair the borrowing capacity of the municipality for work on hand, has forced the mayor to ask that this bill be postponed until a more opportune time. Mayor Smith said: "It is most unfortunate that this great project has to be delayed. The city is in great need of the circuit to relieve the constant congestion of traffic in our central streets, but, owing to the decision of the city solicitor, I have found that to place these properties on the city plan would cause them to become a charge against the borrowing capacity of the city and seriously hamper work now under way. After an investigation the city solicitor has informed me that such action would, in accord with the decision of the Supreme Court, react against the city and tie up our finances. Therefore, I have had to ask that the matter be laid over for a time. The question will be taken up again at the earliest possible moment. It will cost between \$30,000,000 and \$40,000,000 to complete the project."

### Pennsylvania's State Highway Budget.

Harrisburg, Pa.—State highway commissioner Black has made public the budget of the State Highway Department for the years 1917 and 1918 in presenting it at the conference called by the Pennsylvania State Grange and the Pennsylvania Motor Federation in Philadelphia and the figures previously published, as emanating from that conference, were those agreed upon by the grange officials and the motor federation officials after considering the budget offered by the department. Commissioner Black

said that the department had considered it advisable to make public its own figures with the explanation that those published in Philadelphia were these figures as amended by the conference. For state highway construction, \$6,000,000 each year is asked, or \$12,000,000 total. For the construction of state highway routes in boroughs, it is estimated that a total of \$2,000,000 will be required. This money is to be used only in building missing links in boroughs, where a state highway route is improved up to each end of the borough, the money to be allotted to the various counties on a mileage basis, final decision as to the expenditure to be left to the highway commissioner. Any unexpended balance in each county is to be available for use on routes outside of boroughs of the county. For state aid construction and maintenance, a total for the two years of \$3,000,000 will be needed. Purchase of turnpikes and toll bridges, it is estimated, will require the sum of \$500,000 during the two-year period, this money to be spent only on a fifty-fifty basis, the local authorities, in all cases, paying fifty per cent of the cost of freeing toll roads and bridges. Township road bonus deficiency for the years 1912, 1913 and 1914 will take up \$1,350,000. In addition to these sums, legislation making available the automobile license fees for state highway maintenance, \$6,000,000 will be needed each year. The total budget for the biennium amounts therefore to \$24,850,000.

## SEWERAGE AND SANITATION

### Infantile Paralysis in West Virginia.

Fairmont, W. Va.—All public meetings in Elkins, Grafton and Fairmont have been suspended by the health authorities, because of an epidemic of infantile paralysis which to the present has developed forty-nine cases and caused nine deaths in the three towns. The public schools here are closed and all children under sixteen years are permitted to go on the streets only when absolutely necessary.

### 300 Sick from Impure Water.

Iowa City, Ia.—Between three and four hundred Iowa City residents and State university students were made ill from drinking city water because an employe at the water company's pumping station neglected to turn a valve and for five hours impure water from the river was permitted to flow into the city mains. So far none of the symptoms indicate any serious epidemic, but health authorities are taking precautions against possible sickness. Dr. Walter L. Bierring, president of the state board of health, has announced that he fears no serious outbreak at the present time.

### Supreme Court Upholds Sanitary Ordinance.

Birmingham, Ala.—The decision of the supreme court giving any municipality in Alabama the police power to require a person to install sanitary closets, to require connections with the town's sanitary sewerage system and to claim a lien on property for the costs of installation and connection is hailed as a great victory by commissioner J. R. Hornady. "The commission instituted a friendly suit last summer against J. H. Spear to make a test case," said commissioner Hornady. "Birmingham previously had adopted an ordinance requiring connections with the sanitary sewerage system and claimed a lien on certain property owned by Spear on the ground that he refused to make the connection and that the city was forced to do so. Spear contended that the ordinance exceeded the commission's authority and maintained that it was invalid. The Jefferson county chancery court refused to give him an injunction but instead upheld the validity of the ordinance. The supreme court affirmed the decision of the chancellor. As the result of this decision Birmingham will become a really sanitary city. The city is constantly extending its sanitary system, and is experiencing great difficulty in making some of the property owners install sanitary closets and realize the costs from a lien on the property. It is the most important decision affecting sanitary improvement that has been rendered in years." Up until November 1 the department of health had made 1,500 installations and connections during 1916. Fewer than 300 were made in 1915.

### Modify Toledo's Sewerage Plans.

Toledo, O.—Plans for the elimination of sewage from Ten-Mile creek will not include a disposal plant immediately. In the meantime the sewage will be discharged into the bay. Ultimately, city engineer McClure said, a general disposal plant for the entire city will be constructed on the east side of the river, beyond the city. This policy was determined at a conference in which W. H. Dittoe, chief engineer of the state board of health; consulting engineer William H. Hoad, of the University of Michigan; special sanitary engineers Watson Harmon and A. A. Jones, service director Goodwillie, engineer McClure, and county sanitary engineer L. A. Boulay participated. McClure said the plan would obviate the necessity of several pumping stations and greatly reduce the initial cost of constructing the intercepting sewer system. The engineers agreed to provide capacity for the sewage of a district extending beyond the city to Wernert's corners and Ottawa Heights, until 1960 on the basis of estimated population of 700,000 in that year. The Swan Creek sewer is to provide facilities for the Maumee river district extending to the town limits of Maumee. The plans for the Swan Creek district will not be ready for several months. The Ten Mile creek plans, McClure said, will be finished in sixty days, now that the general policies have been definitely determined. Then they will be submitted to the council and the state board of health, and if they are approved it will be up to the council to provide the money by bond issue. The cost has not been estimated, but probably will be something less than \$500,000.

## WATER SUPPLY

### Broken Suction Causes Water Pollution.

Fort Wayne, Ind.—Fort Wayne's city water supply, it is found, was polluted with sewage organisms directly from the St. Mary's river. A suction line under the river bed was broken in some manner and improperly repaired. As a result river water was introduced directly into No. 2 pumping station and forced through the city mains. The cut off valve was closed and the water supply then began clearing up. The water is now pure again, according to the analyses of J. C. Diggs, state water chemist. Years ago the No. 2 pumping station was situated across the river from the present location. The wells that supplied these pumps were not abandoned when the new station was built across the river, but instead were connected with the new installation by a group of suction lines laid under the river bed. It is claimed that one of these lines broke, admitting river water directly into pumps and from the pumps into the mains. The state chemist urges that all dual connections be placed under the direct supervision of the water-work department and permitted only when the private wells have been thoroughly tested or when the connections have been made break and fool proof.

### Metering and Consumption.

Springfield, O.—That plans are being worked out at present whereby it will be possible for every water consumer to install a meter has been announced by city manager Ashburner. He said that while it is impossible for the city to pass legislation compelling water users to put in meters at their own expense, he thought the plan now under way will be of sufficient attractiveness to warrant the consumers to do this. It is pointed out that the plan of installing meters is not only a saving to the city, but more so to the consumer. In cases where consumers do not use meters they are forced to pay an average flat rate, which runs about three times as high as the metered service, according to the figures obtainable by the city. At present the city is furnishing the customers meters practically at cost. The meters cost the city \$7.75 in wholesale lots and are now being sold at \$8. This includes the setting of the meters by the city without extra cost and at the same time about 15 cents worth of material must be furnished by the city for each meter, leaving about 10 cents "profit" to pay for the setting. The price of meters was advanced to \$8 a few days ago from \$7.35, owing to the advanced cost in

manufacturing them. In 1915 it was estimated that there were 3,146 metered services in the city for domestic use. The figures this year will probably reach the 4,000 mark for domestic service out of about 12,000 services. The demand for meters during the last year has been far above the average of preceding years. Last year the metered service consumption was 34.5 gallons, while, it is estimated, the flat rate services used 98.6 gallons per capita daily. In 1914 the difference in the flat rate consumption and the metered service was even greater. The flat rate daily consumption per capita was 109.5 gallons, while the metered service was 33.8 gallons. In the unmetered water it is estimated that there is a waste of at least 44 per cent, or an average daily waste of 2,838,000 gallons based on the figures for 1915.

#### Court Order Halts Filtration Plant Work.

Great Falls, Mont.—Although the machinery has arrived in the city for the new \$200,000 filtration plant of the waterworks, it will not be installed for some time. The delay is mandatory, an order having been served from the supreme court enjoining further action until the injunction suit brought some months ago by Joseph McClinton to prevent the city from completing this feature of its water system shall be heard before the supreme court. The construction work has been progressing satisfactorily since the contract was let and there was no doubt, but for the present delay, that construction would have been completed in time to take care of the city's water supply next summer. After a bitter fight a year ago, the city voted a bond issue of \$150,000 and subsequently there was a contract let for the building of a filtration plant, the total cost of all features being something in excess of \$210,000. Following the letting of the contract, Mr. McClinton, who had been a leader in opposing the bond proposition and who had been defeated for re-election for councilman subsequently in a campaign in which the old issue followed up to a considerable extent, became the petitioner in a suit to enjoin the city from building the plant on the ground that the cost was in excess of the amount authorized by the bond election. In the district court the city won and the injunction was denied, but the petitioner carried the case to the higher court. The initial outlay for the filtration plant has practically been made and should the higher court make the restraining order permanent, the city would be a heavy loser for the work.

## STREET LIGHTING AND POWER

#### Lighting Contract Awarded.

Utica, N. Y.—The contract for lighting the city of Utica for five years has been awarded to the Utica Gas & Electric Company, the only bidder, by the board of contract and supply. The action was based largely on the report made by Dr. William Lisenpenard Robb, consulting engineer and head of the department of electrical engineering of Rensselaer Polytechnic Institute at Troy, and was taken over the protest of the Utica Chamber of Commerce. In his report Dr. Robb said that the present system of lighting in the city is in line with the most up-to-date practices in other cities. He stated that as much new equipment must be furnished under the new contract, he thought it would be only fair to have the contract extend for five years. He presented a comparison of the prices in various cities with those in proposed Utica contract, as follows:

	Utica.	Syracuse.	Roches-	Schenec-
			ter.	tady.
6.6. amp. or ornamental magnetite	\$85.00	....	\$91.25	\$90.00
600 c. p. ....	70.00	\$72.00	57.95	\$76.35
400 c. p. ....	60.00	57.00	....	....
250 c. p. ....	46.50	42.00	....	....

"The 600 c. p. lamps at Rochester are not equipped with any refractors," says the report. "The Utica contracts specifies their use. The refractors will increase the efficiency of the lamps as a street lighting unit at least 50 per cent." Dr. Robb agrees with Mr. Lofquiet, an illuminating engineer for the Utica Gas & Electric Company,

who showed that the proposed prices in the contract are somewhat less than would be required to operate the lamps after allowing eight per cent for depreciation, two per cent for insurance and taxes and five per cent for interest on investment. The analysis is an eminently fair one. In reference to improvements in the art, the engineer said that the city is fully protected, both in regard to additional lights and others. He further stated: "The specifications call for the installation of graphic meters at the station of the Utica Gas & Electric Company on each of the series street lighting circuits. These will give the city authorities a complete record of the current supplied each circuit at every instant the circuit is operated. On series circuits, such as are used in street lighting, the current is always the same at all parts of the circuit. It has been suggested that these meters should be installed in the City Hall. This is impracticable, as it would necessitate bringing high tension wires from each circuit to the City Hall. This would introduce a dangerous life and fire hazard. The engineers who appeared for the Chambers of Commerce suggested that the city enter into a contract with the Utica Gas & Electric Company for supplying the electric power necessary to operate the street lamps and enter into a contract with someone else for installing and maintaining the pole and wire system and lamps. This scheme is absolutely impracticable. This divided responsibility would lead to endless disputes and generally unsatisfactory service."

#### City Gives Up Light Plant.

Holgate, O.—This village, after operating a municipal lighting plant and waterworks for fifteen years, has granted a franchise and entered into contract with the Northwestern Ohio Light Co. for electric service. A transmission line will be constructed from the Leipsic plant of the light company and the Holgate waterworks operated by electrically driven pumps.

#### Gas Company Must Refund Excess Charges.

Newark, O.—Decision of the U. S. supreme court, announced at Washington, which upheld an injunction order restraining the natural gas company from charging consumers more than 18 cents per thousand feet, the rate fixed by city council March 6, 1911, will mean that \$194,000 which represents the excess over that rate paid in by consumers since then, will be distributed to the consumers. The gas company ignored the ordinance rate. The money is in the hands of a trustee to whom it has been paid as fast as collected. The trustee states that two months will be required to pay back the money. The city won in all of the state courts and the defendants carried the case to the federal court on the ground that the Newark distributing company was a separate concern from the Logan company which produced and transported the product. The city contended that the two companies had one identity. In a unanimous opinion by Justice Pitney, the court held that it had not been shown that the rate rule was in fact confiscatory.

#### To Vote on Big Franchises.

Dallas, Tex.—Mayor Lindsley and city commissioners have decided that the granting of the light and street railway franchises to Strickland and Hobson will be propositions on the ballot in the general city election on April 3. The will of the people in reference to the granting of the franchises was ascertained in December by a post-card "straw vote," and about 90 per cent of the qualified votes showed that the people were favorable to the franchises. The ordinances to grant franchises to Strickland and Hobson to organize and operate the proposed new light and street railway companies in Dallas may become operative by resolution of the board after thirty days, or within a period of six months after January 8, when they were finally passed. However, it is the board's plan not to make them effective unless the voters shall so direct on April 3. Attorneys for J. F. Strickland, who will head the new light company, and C. W. Hobson, head of the new street railway company, filed bonds in the amount of \$1,000,000 to guarantee to the city the carrying out of specified agreements to comply with the ordinances. The proposed improvements include \$2,000,000 worth of improvements to

the light and power properties, \$1,000,000 on the street railway lines, a new interurban at least thirty miles long, with Dallas as a terminus, work to begin on the new lines within six months after the new company begins operations, and a second interurban line not less than thirty miles in length, provided the revenues of the street railway company reach an amount equal to specified contract terms.

## FIRE AND POLICE

### New York to Try Out Two Platoons.

New York, N. Y.—Without a single dissenting vote, the Board of Aldermen passed a resolution calling on Fire Commissioner Adamson to give the two-platoon system a trial with one division of his department for a period of six months, "under the supervision of a deputy chief who is without prejudice in this matter." This provision was put into the measure because at the hearing held by the public welfare committee on the project Commissioner Adamson and Fire Chief Kenlon strenuously opposed the inauguration of the two-platoon system in the New York fire department on the ground, first, that it would not improve the service, and, second, that it would prove enormously expensive to the taxpayers. However, it is understood that Commissioner Adamson is not averse to giving it a trial, in a small way, as he thinks that the experiment would prove his contention that the system cannot be adopted successfully in this city. Upon the completion of the trial the fire commissioner is to forward to the Board of Aldermen a complete report, setting forth in detail his own opinion and the opinion of the officers of the two-platoon division, with a statement of cost and the efficiency of the service. The board will then take up the question of the establishment of a two-platoon system for the entire fire department. President Frank L. Dowling, of the board, maintained that the expense of the two-platoon system would not be nearly as large as the men opposed to it were trying to make the people believe.

### Chief Injured in Fall from Ladder.

Rochester, Minn.—One of Rochester's oldest and largest business buildings, the Horton block, was entirely destroyed by fire, entailing an estimated loss to the building and several store stocks of \$300,000. A heavy wind fanned the flames, and for a time a general conflagration was feared. Aided by volunteers, however, the local fire department successfully fought the blaze. Chief E. T. Praker of the fire department was injured seriously when he fell thirty-five feet from a ladder. The Winona fire department sent apparatus and men on a special train. Low water pressure hampered the firemen.

### Two Platoon Systems to Be Installed.

Scranton, Pa.—Among the new year's improvements in the city is the installation of the two platoon system. The new plan will go into effect February 1st. It provides for two forces of fire fighters, one to be on duty from 8 a. m. to 6 p. m., and the other from 6 p. m. to 8 a. m., the shifts alternating weekly. Thirty-six additional men are to be appointed to make the change operative.

### Urge State Police Bureau.

Sacramento, Cal.—The establishment of a state bureau of criminal identification was advocated at a conference of the California division of the International Association of Criminal Identification held at the city hall in Oakland. A bill, which will be presented to the state legislature during the coming session, was discussed and agreed upon at the meeting. The bill provides for the establishment of a state bureau of criminal identification with a board of managers, the board to consist of one chief of police, one sheriff and one district attorney. The Bertillon system of identification will be entirely eliminated in California should the bill become law. The speakers pointed out that the usefulness of the Bertillon methods have passed, the finger-print system being amply sufficient for all identification purposes. It is also proposed that the board of managers of the state bureau of criminal identification be vested with the power of granting licenses to the numerous private detective agencies operating in

the state. These licenses are at present issued by the board of prison directors and it is felt that a board composed entirely of police officers would be in a better position to decide on the advisability of granting detective agency licenses. A resolution was passed, on the motion of chief of police Vollmer of Berkeley, advocating the establishment of a psychopathic ward for the purpose of placing under observation those people with criminal tendencies and the resolution also urged the building of a home for feeble-minded persons. The indeterminate sentence was unanimously endorsed by the association. This provides for the sentencing of a criminal to an indeterminate sentence and if the authorities are satisfied, after careful observation of the prisoner, that it is safe to assume that he is no longer a danger to society, his release would be recommended; if on the other hand they are convinced that he is incorrigible, it would permit of the prison authorities keeping him in jail indefinitely.

### Department Does Well.

Hillsdale, Mich.—The local fire department put up a good fight in a recent fire. The blaze began in the basement of a shoe store and threatened the principal business block of the town. After a three-hour fight, led by chief Robert Morlock, the fire was gotten under control and confined to the store, which suffered a \$20,000 loss. The work of the firemen saved adjoining property valued at \$300,000.

### Lack of Apparatus Hampers Men.

Rock Island, Ill.—Inadequacy of fire-fighting apparatus is blamed for some of the \$161,000 loss in a fire which swept a big business block. The blaze was one of the worst in the city's history and originated in a defective flue. It was about an hour after the firemen began fighting the flames in the basement that the city's aerial truck arrived. The city of Moline sent an aerial truck to help and Davenport sent a pumper. All five of the local companies were at the fire. Several of the firemen were overcome by smoke and exposure to the cold.

### Police Pay Raised.

Pittsfield, Mass.—Both branches of the city council have passed the ordinance amendment to provide increases in the pay of the members of the police department, to go into effect at once. The chief of police will receive \$1,800 a year, the captain \$1,500, inspector \$1,450, sergeant \$1,350, patrolmen, four years and over, \$3.50; three years, \$3.25; two years, \$3; one year, \$2.75; police matron, \$3.25 a day; police patrol driver, \$3 a day. The city solicitor will draw up an ordinance creating the office of a city mechanician who would look after the repairs of the automobile apparatus owned by the city, including the machines in the fire, police and board of public works departments. The Morningside fire station will probably be made the municipal garage and each department will be charged for the time of the mechanician actually spent on repairs for that department and also for the material used in making the repairs. The salary is to be \$1,300 a year. The mechanician will be subject to the call of the fire department ahead of the other departments.

## MOTOR VEHICLES

### New Aerial in Service.

Batavia, N. Y.—Batavia's new 55-foot aerial motor truck has arrived from Buffalo and has been placed in service at headquarters. Only the large ladder and the revolving equipment from the former Hooks' horse-drawn truck were used in the building of the new motor truck, and the work complete will cost \$4,500. The truck was built by the E. R. Thomas Motor Car Company of Buffalo, which company also furnished the two motor chemical trucks now in service. The aerial has a 22-foot wheelbase and measures 42 feet from the radiator to the end of the ladders. Provision is made for carrying hose in a basket at the rear, and the gasoline tank and vacuum feed system are also located beneath the truck. The truck has a six-cylinder, eighty-horse power motor and there are five speeds—four forward and a reverse. The speed may be regulated at from five to forty miles an hour.

**Complete Motorization.**

Franklin, Pa.—Following a three-year demonstration of excellent service by the Thomas hose and chemical truck, installed in November, 1913, the city has installed a new Thomas combination. The machine is a six-cylinder, 90 h.p. hose, chemical and pumper with an adequate equipment of ladders. The department now has no horses in service. The other city departments are also motorized, the street department having one small truck and trailer and one large truck. The police department has a small car and two motorcycles and the engineering department a small car. City clerk J. G. Crawford states that the auto apparatus in service has absolutely demonstrated the economy and efficiency of motorization.

**Milwaukee's New Apparatus.**

Milwaukee, Wis.—The accompanying illustration shows the city's three new pieces of motor equipment, recently installed. The department, under chief Thomas A. Clancy, is rapidly being motorized, the city now owning eighteen motor-driven fire-fighting machines, exclusive of officers' cars.

**GOVERNMENT AND FINANCE****City Manager Plan in New Charter.**

Kansas City, Mo.—The city manager plan of government has been written into the new city charter by the charter board, composed of freeholders elected at the last municipal election. The vote stood 7 to 5 in favor of changing from the present plan of ward government to the new system. The charter, on completion, will be submitted to the people for adoption.

**Tax Collection Suspended by Court.**

Toledo, O.—The tax machinery of Lucas county was brought to a standstill by order of the state tax board, following a decision by the state supreme court holding the Parrett-Whittemore tax bill unconstitutional. The court held that the revision boards of Lucas, Hamilton, Cuyahoga and Mahoning counties, which have not finished their work, will not be permitted to do so. The order to the local board to suspend to give the state commission a chance to see where tax matters stand, came at a time when the board was engaged in most important work. The board just recently took up the personal property tax work, through which it hoped to add \$3,000,000 or more to the tax duplicate. Sixteen thousand alleged tax dodgers were summoned to appear before the board. The taxers started calling them in by wards. More than 10,000 were under subpoena who had made no returns. The others had made too low returns. Complaints were filed against a large number of Toledo's wealthy citizens by Arthur S. Webb, the chief clerk of the revision board.

**Must Separate Finances of Utility Department.**

Olympia, Wash.—That a city has no power to require one public utility to loan money to another department unless the current rate of interest is charged; that a city has no right to require a utility to furnish free service or service below the usual cost to other utilities or municipal departments; that a city council has no power to appropriate, directly or indirectly, any part of the income or surplus of one utility for the benefit of another utility, are some of

the principal holdings made by R. E. Campbell, assistant attorney general, in a written opinion submitted to the state bureau of inspection of public offices. "We find no provision of the statute which directly prohibits the loaning of money by one municipally-owned utility to another," states the opinion. "The mere fact, however, that the statute does not expressly prohibit such loans does not warrant the conclusion that they can be legally made." The bureau has asked the attorney general whether or not it is legal for a utility to receive as a gift from the general fund of a city a contribution for the purpose of providing working capital, or for covering a deficit. In answer to the question Mr. Campbell states: "We know of no provision in the statute which prohibits a municipally-owned public service from receiving a gift from any source. We are of the opinion, however, that the city authorities cannot make such a gift as that referred to in this instance."

**City Manager Plan Wins.**

Alameda, Cal.—At a special charter election citizens of Alameda have voted in favor of the city manager plan of government. The new charter carried by a majority of 331. The total vote was 3,904, out of a registration of 12,000. Before the charter can be put into effect it must be approved by the Legislature, but it is hoped to inaugurate the new plan in March. The new charter, similar to that of San Jose, provides a city manager at a minimum salary of \$3,000 a year to be chosen by five councilmen, who will be elected by the people. There are nine councilmen at present. An election will be called in March.

**City Manager Form Adopted.**

Ballinger, Tex.—Ballinger has adopted the commission-manager form of government, the vote on the change being 176 for and 111 against. R. T. Williams and C. A. Doose were elected commissioners to act with mayor Powell until the election in April, at which time a city manager will be appointed.

**New York Cities Ask for Legislation.**

Albany, N. Y.—The cities in the state will ask the legislature to write six new laws on the statute books this winter, according to an announcement made by mayor Cornelius F. Burns, president of the New York State Conference of Mayors and Other City Officials. The bills which have been prepared and soon will be introduced are as follows: A state traffic act, providing uniform traffic regulations for all cities and villages in the state. A home rule constitutional amendment, giving cities authority to manage their own local affairs, and relieving the legislature of the labor of considering a mass of local legislation. An amendment to the municipal empowering act, giving cities the same authority New York City now has to limit the height of buildings and to restrict the use of property. A bill giving cities authority to establish market departments with comprehensive powers. A uniform municipal bond bill for second and third class cities. An amendment to the Penal Code, giving cities authority to open or close motion picture theatres on Sunday, and if open, to regulate them. "Committees of city officials, assisted by our state bureau of municipal information, have been working on these bills for some time," said mayor Burns. "They have been very carefully thought out and in preparing them we have sought the help of the best experts in the country. All are vital to every city and



MILWAUKEE'S  
THREE NEW  
AMERICAN-LA FRANCE  
FIRE-FIGHTING  
AUTOS.

should be enacted into law. In addition to these bills the cities, acting through the conference, will advocate the enactment of the so-called home rule education bill, which they have opposed for two years, but which has been re-drafted and is now satisfactory. The cities will also advocate amendments to the election law, which will reduce the cost of elections in cities and changes in the tax law, which will reduce exemptions from taxation. We shall also advocate the abolition of toll bridges, the restoration of the optional cities charter law, the establishment of the State Farm Colony for Tramps and Vagrants and the enactment into law of the program advocated by the governor's food commission and senator Wick's committee. The cities will oppose all legislation which will impose unnecessary municipal tax burdens, reduce sources of revenue for cities or curtail their powers of local self-government."

#### The Mayoress of Umatilla.

Umatilla, Ore.—The Umatilla municipal government is now in the hands of women. Mrs. Laura J. Starcher, wife of the retiring mayor, whom she defeated at the last election, having taken her office, along with a woman recorder, treasurer and four councilwomen. Her "inaugural" address, according to newspaper reports, was a sharp satire on "mere man" and she began her regime by saying the "petticoat" government would not appoint a marshal, as the town had no need of one. In the appointment of committees, Mrs. Starcher named only women, leaving the hold-over male members of the council entirely out. The women officers besides the mayor are: Mrs. Bertha Cherry, recorder; Mrs. Lola Merrick, treasurer; Mrs. Stella Paulu, Mrs. Gladys Spinning, Mrs. Anna Means and Mrs. Chauncey Brownell, councilwomen. Some of the women are wives of former city office-holders and their election last December was the result of a last hour coup.

### STREET CLEANING AND REFUSE DISPOSAL

#### Cost of Street Cleaning.

Indianapolis, Ind.—James G. Rochford, superintendent of the city street cleaning department, has filed with the board of public works his report for 1916. The report says a total of \$152,719.67 was spent by the department during the year in cleaning 292.53 miles of improved streets, the average cost per mile being \$522.06. In 1915, 274.83 miles of improved street were cleaned at an average cost of \$522.90 a mile.

#### Force Clean Sidewalks in "Snow Limits."

Spokane, Wash.—Spokane has defined distinct "snow limits," inside which the city government will undertake to keep sidewalks clear of snow in winter. This action was taken by the city council when the boundaries of the "snowless section" were set by a unanimous vote. Commissioner Funk was instructed to keep all walks in the district clear at any cost. In cases where property owners fail to clear their walks properly the public works department will do the work and the cost will be charged up to the property. The new measure forbids property owners from dumping snow from their property or the roofs of buildings upon the street or sidewalk, and provides for a \$25 fine for offenders. Nothing in the law prohibits the removal of snow from the sidewalk to the street. Under the terms of the ordinance, a property owner, before depositing snow on the walk or street, must obtain a permit from the public works department and put up a small bond. The snow deposited under the permit must be removed within four hours, or the public works department will clear it up and take the cost out of the bond.

#### Butte's New Incinerator.

Butte, Mont.—The city officials are greatly pleased with the operation of the new incinerating plant. The most severe test made on the plant was one day recently when 25 tons of matter was consumed in 7½ hours. The capacity of the plant is 50 tons every 24 hours and it burns all garbage and refuse and dead animals. Since the plant started very little coal has been used, as the plant furnishes its own

fuel. The residue from the consumed garbage is a very fine ash, only about 10 per cent of the total tonnage consumed. This is carted away and distributed. The plant furnishes heat to all the other buildings, including the barn, corral, machine shop and oil house. The total number of men employed about the plant is fourteen, five of whom work at the incinerator proper. The plant itself cost the city \$44,880; the other buildings, \$10,000; the fence, \$1,690 and the plumbing, \$2,087, making a total of \$58,667. It is expected that the plant will pay for itself easily within five years. The ordinance requiring housekeepers to use two separate cans, one for ashes and the other for garbage, is being well obeyed. The tin cans are separated from the garbage and sold to the Anaconda company, and the city thus makes an additional profit.

### MISCELLANEOUS

#### To Vote on City Plan Proposal.

Spokane, Wash.—A charter amendment, authorizing the establishment of a permanent city planning commission, will be submitted to a vote of the people at the November election. This course was definitely decided upon after a conference between commissioner Fassett and corporation counsel James M. Geraghty. The former plan, that of establishing the commission by action of the city council, has been shelved. The new plan is said to be surer and will obviate any legal difficulty. The new commission would be a body analogous to the present park board, with somewhat similar powers, with the exception that it would not have the authority to spend or appropriate money for improvements which it might suggest. It would, however, have the power to hire experts to work out a city plan. The work of the board would be the hiring of these experts and a general supervision of the workings of the city survey and recommendations for improvements. The vital feature of the whole scheme, says commissioner Fassett, is the fact that not only will it save the city millions of dollars, but will increase realty values all over the city.

#### Cooperative Store for City Employees.

New York, N. Y.—With the approval of Mayor Mitchel the 87,000 employees of New York City are organizing a cooperative buying movement under the title "Civic Employees Cooperative Purchasing Association." The association will be organized somewhat after that of the employees of the Department of the Interior at Washington. At the start it will be the purpose of the association to eliminate the retailer's profit out of the high cost of living. Later it is the intention to connect the city employees' organization with the producers of many commodities. The plans being formed now have to do chiefly with the purchase of foodstuffs, but later the employees will be able to buy clothes, coal, haberdashery, millinery, furniture and sporting goods in cooperation and expect to realize a saving of from 15 to 50 per cent. The system will first be put into the Municipal building, where there are between 5,000 and 6,000 men and women employees. John H. Greener, chief clerk of the Law Department, who was the first to take up with Mayor Mitchel the possibility of extending the Law Department's cooperative buying scheme to all the city employees, states: "A system that has been running along by very crude methods and yet netting a saving of 15 per cent has been in vogue in the Law Department. We have handled butter and eggs, Bermuda onions and other food products, disposing of five cases of eggs and as many cases of butter each week, besides six or eight boxes of apples, grapefruit and a large quantity of Christmas candy. Some other departments have been buying cooperatively the same as the Law Department. The main departments, of course, are the policemen, firemen, teachers, cleaners, and under our system of having an agent in each city building no one will be without a chance to save by cooperation. The distributing agencies will not be devised to cover merely departments. That would result in confusion. We find that the simplest method will be to organize with a branch agency in each building."

## NEWS OF THE SOCIETIES

## Calendar of Meetings.

Jan. 23-25.—CANADIAN SOCIETY OF CIVIL ENGINEERS. Annual meeting, Montreal, Can. Secretary, C. H. McLeod, 176 Mansfield St., Montreal.

Jan. 23-25.—AMERICAN WOOD PRESERVERS' ASSOCIATION.—Annual meeting, New York City. Secretary, F. J. Angier, B. & O. Mt. Royal Sta., Baltimore, Md.

Jan. 25.—MASSACHUSETTS ASSOCIATION OF BOARDS OF HEALTH. Annual meeting, Boston, Mass. Secretary, Dr. Francis H. Slack, Health Department, Boston, Mass.

Jan. 25-26.—ILLINOIS SOCIETY OF ENGINEERS. Annual convention, Chicago, Ill. Secretary, E. E. R. Tratman, Wheaton, Ill.

Jan. 31-Feb. 2.—OHIO ENGINEERING SOCIETY. Annual meeting, Ohio State University, Columbus, O. Secretary, John Laylin, Norwalk, O.

Feb. 5-9.—AMERICAN ROAD BUILDERS' ASSOCIATION. Seventh American Good Roads Congress and Eighth National Good Roads Show, Mechanics' Hall, Boston, Mass. Secretary, E. L. Powers, 150 Nassau street, New York City.

Feb. 7-9.—AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS. Midwinter convention, New York City. Secretary, F. J. Hutchinson, 33 West 39th St., New York City.

Feb. 7-9.—MINNESOTA SURVEYORS' AND ENGINEERS' SOCIETY. Annual meeting, Minneapolis, Minn.

Feb. 7-15.—TENTH CHICAGO CEMENT SHOW, Coliseum, Chicago, Ill. Secretary, Blaine S. Smith, 210 South La Salle Street, Chicago.

Feb. 8-10.—AMERICAN ASSOCIATION OF ENGINEERS. National convention, Hotel La Salle, Chicago, Ill. Headquarters, 29 La Salle Street, Chicago.

Feb. 8-10.—AMERICAN CONCRETE INSTITUTE, Hotel La Salle, Chicago, Ill. Secretary, Harold D. Hynds, 1418 Walnut Street, Philadelphia, Pa.

Feb. 9.—TEXAS TOWN AND CITY PLANNING ASSOCIATION. Semi-annual convention, Sherman, Tex. Secretary, J. E. Suratt, Secretary Chamber of Commerce, Sherman.

Feb. 12-14.—AMERICAN CONCRETE PIPE ASSOCIATION. Annual convention, Chicago, Ill. Secretary, E. S. Hanson, 538 South Clark Street, Chicago, Ill.

Feb. 15-16.—WISCONSIN ENGINEERING SOCIETY. Annual meeting, Madison, Wis. Secretary, L. S. Smith, 939 University Ave., Madison.

Feb. 19-24.—SOUTHWESTERN CONCRETE ASSOCIATION. Annual meeting and concrete show, Convention Hall, Kansas City, Mo. Chairman, Show Committee, Chas. A. Stevenson, 1433 West 10th Street, Kansas City, Mo.

April 17-19.—TRI-STATE WATER AND LIGHT ASSOCIATION OF THE CAROLINAS AND GEORGIA. Seventh annual convention, Macon, Ga. Secretary-treasurer, W. F. Stieglitz, Columbia, S. C.

April 18-22.—NATIONAL CONFERENCE ON COMMUNITY CENTERS. Annual conference, Chicago, Ill. Secretary, John Collier, 70 Fifth Ave., New York, N. Y.

May 8-10.—NATIONAL FIRE PROTECTION ASSOCIATION. Annual meeting, Washington, D. C. Secretary-treasurer, Franklin H. Wentworth, 87 Milk Street, Boston, Mass.

June 11.—NEW YORK STATE CONFERENCE OF MAYORS AND OTHER CITY OFFICIALS. Annual conference, Buffalo, N. Y. Secretary, W. P. Capes, 25 Washington Ave., Albany, N. Y.

Nov. 12-16.—AMERICAN SOCIETY OF MUNICIPAL IMPROVEMENTS. Annual convention, New Orleans, La. Secretary, Charles C. Brown, 469 Transportation Building, Chicago, Ill.

## American Road Builders' Association.

In arranging the program for the Seventh American Good Roads Congress to be held in Mechanics Building, Boston, Mass., February 5 to 9, under the auspices of the American Road Builders' Association, the committee in charge has selected a number of leading subjects and has decided to devote an entire session or a definite part of a session to the consideration of each topic. Each will be introduced in a formal paper, prepared by a leading authority, and the subject will then be open for discussion by the delegates. Among the subjects to be treated at the various sessions are the following:

Bituminous roads and pavements and treatments. (Sheet asphalt—bituminous macadam—bituminous concrete, etc., etc.)

Cement concrete roads and pavements.

Stone block roads and pavements.

Wood block roads and pavements.

Brick roads and pavements.

Traffic—its effect on design, construction and maintenance and its regulation.

Contractor's plant or equipment.

Earth, gravel, sand-clay and miscellaneous roads and pavements.

Among the papers which have been selected to be read during the convention are the following:

"Policy and Program of Government in Road Construction Under New Federal Aid Law," Logan Waller Page, director, United States Office of Public Roads and Rural Engineering.

"Highway Engineering Education," T. R. Agg, professor of Highway Engineering, Iowa State College.

"Best Practice in Concrete Road Construction," H. E. Breed, first deputy commissioner, New York State Commission of Highways.

"Recent Practice in Granite Block Pavements," Wm. H. Connell, chief, Bureau of Highways and Street Cleaning of Philadelphia, Pa.

"Recent Practice in Wood Block Pavements," Ellis R. Dutton, assistant city engineer of Minneapolis, Minn.

"Best Practice in Brick Pavement Construction," F. R. Williams, paving engineer of Cleveland, O.

"Traffic Census; Its Application to the Design of Roadways, Selection of pavements and Traffic Regulation," D. B. Goodsell, assistant engineer, Department of Public Works of the Borough of Manhattan, New York City.

"Earth and Gravel Road Maintenance," R. L. Morison, professor of Highway Engineering, Agricultural and Mechanical College of Texas.

The tentative program calls for the opening of the Eighth National Good Roads show on February 5. The registration of delegates and visitors will proceed during the day. In the evening the officers of the American Road Builders' Association will tender a

formal reception to the exhibitors in the convention hall.

The first session of the congress will be called to order in the convention hall at 11 o'clock Tuesday morning, February 6, by the president of the American Road Builders' Association. Governor S. W. McCall of Massachusetts and Mayor James M. Curley of Boston will welcome the delegates to the state and city respectively and other addresses will be made by Col. Wm. D. Sohier, chairman of the Massachusetts highway commission; Charles F. Weid, president of the Boston chamber of commerce, and George W. McNear, president of the Bay State Automobile Association. President A. W. Dean will make the response for the association.

A particularly interesting feature of the convention will be the question box. Questions to be discussed must be handed in at the registration booth not later than noon on Wednesday, February 7.

On Tuesday evening, beginning at 7.30 o'clock, an entertainment and smoker will be given by the Massachusetts Highway Association at Convention Hall, on the corner of Garrison and St. Botolph streets. The annual dinner of the American Road Builders' Association will be held at the Hotel Copley-Plaza at 7 o'clock on Wednesday evening.

The reports of committees will be presented at a business meeting of members of the association at 4.30 o'clock on Thursday, February 8.

## National Parks Conference.

Every phase of the national parks question, including administration, conservation, development, education, art, recreation and transportation, was discussed at the national parks conference, held in Washington, D. C., January 2d to 6th. All sessions of this gathering, which was arranged by the Department of the Interior, were held in the new National Museum.

"You must feel that you are participating in a work that will make a greater America," Franklin K. Lane, secretary of the interior, under the auspices of which the conference was arranged, told the delegates, "and that you are contributing something noble to the resources of the United States."

Representative Scott Ferris of Oklahoma, chairman of the House public lands committee, called attention to the fact that where the people of Philadelphia spend per capita \$1.50 yearly for their parks, and the people of Baltimore \$1, the republic is spending out of its enormous direct and indirect revenues but one-sixth of one cent yearly for each of the hundred million citizens who are joint owners of the national parks. "You are pathfinders in the movement to remedy this condition," he told the members of the conference.

National park facilities have been inadequate throughout the world since the residents of the first one, the Garden of Eden, were ousted and made to

engage in agriculture, said Carl Vrooman, assistant secretary of agriculture, who added, however, that his department, through the making possible of golden harvests from the land outside of America's parks, is enabling the people to enjoy in their leisure some of the pleasures and privileges lost so long ago.

That he expects to see a tenfold increase in the population of Alaska in as many years, with several cities of 25,000 inhabitants, was the statement of Prof. Lowell Jackson Thomas of Princeton University, writer, explorer and lecturer, who spoke at the afternoon session, and who considers that its scenery is Alaska's greatest asset.

He believes that this rapid growth will come with the completion of the new Alaska railroad the government is building from Seward, on Resurrection bay, to Fairbanks, in the Tanana valley.

Other speakers were J. B. Harkin, commissioner of Dominion parks, Department of the Interior, Canada; Enos Mills, Mrs. John Dickinson Sherman, conservation chairman, General Federation of Women's Clubs; Huston Thompson, Jr., assistant attorney general, and J. Horace McFarland, president American Civic Association.

Robert Sterling Yard, of the recently created national parks service, who

presided over the second day's sessions, commented caustically on the impossibility of getting an O. K. for such educational expenditures as are entailed by the use of motion pictures from a Congress, individual members of which declare that what the people need is instruction as to where these wonders are and what they contain.

It is not possible to get a bill O. K.'d for as much as one foot of film, costing 10 cents, stated Mr. Yard, and this notwithstanding the fact that war-ridden Canada is at present generously advertising its parks by this means, and, moreover, is granting facilities and favors to American concerns to thus advertise the Dominion parks to the real owners of their less heralded, but superior, rivals in the United States.

Prof. E. M. Lehnerts of the University of Minnesota, whose topic was "University Classes in the National Parks," in his address amplified this same phase of the parks question; George D. Pratt, conservation commissioner of New York state, spoke on "Organized Out-of-Doors," as exemplified by the Adirondacks, Catskills, etc., and Philander P. Claxton, United States commissioner of education, advocated the bringing of the public schools and the national parks into closer touch.

The speakers and topics at the after-

noon's gathering included Dr. Charles D. Walcott, secretary Smithsonian Institution, "National Parks as a Scientific Asset;" Herbert Quick, member federal farm loan board, "The Author and the National Park;" Gilbert H. Grosvenor, editor National Geographic Magazine, "Teaching by Picture;" the Rev. Charles W. Gilkey of Chicago, "Spiritual Uplift of Scenery in National Parks and the Grand Canyon;" William H. Holmes, head curator, National Gallery of Art, "The Painter and the National Parks," and Fred H. Kiser, "The Photographer and the National Parks."

In an address illustrated by motion pictures, W. A. Welch, chief engineer of the Palisades Interstate Park, described and showed what New York and New Jersey have done for their citizens through its establishment, dwelling particularly on the "week-end" possibilities of this tract and the re-

(Continued on page 116.)

## PERSONALS

Hanmer, H. J., has been re-appointed city engineer of Gloversville, N. Y.

Messrs George W. Fuller and James R. McClinton, of the firm of George W. Fuller, consulting engineers, 170 Broadway, New York City, announce that they have admitted to partnership Mr. Jesse K. Giese, and that the firm name hereafter will be Fuller & McClinton. Mr. Giese graduated at Rensselaer Polytechnic Institute, Troy, N. Y., in 1904, and was a member of the staff of Hering & Fuller, 1904-11; assistant engineer with Hering & Gregory, 1911-14; and for the past two and one-half years has been in charge of the construction of the outfall sewer, pumping station and sewage treatment works at York, Pa.

Rhodes, Arthur J., has been appointed city engineer by the commissioners of Manhattan, Kans. Mr. Rhodes was for two years assistant city engineer and was appointed to succeed former city engineer Walters, who was killed in an auto accident on December 10, last year.

Stecker, Hubert A., has been appointed city manager of Charlottesville, Va.

The following have been elected in West Virginia:

Woodsville—Mayor, Roy B. Naylor; recorder, J. E. Sweeney; councilmen, John H. Clarke, A. W. Paull, George J. Rogers, J. E. Brown and W. H. Higgins.

Pleasant Valley—Mayor, J. A. Bloch; recorder, Frank G. Brockhardt; councilmen, J. S. Gibbs, George E. Stifel, Joseph E. Dudley, William Porter and H. C. Hazlett.

Edgwood—Mayor, Charles M. Criswell; recorder, George E. Carenbauer; councilmen, Charles Eisenbach, J. P. Neihaus, C. L. Herb, John H. Cook and John M. Ritter.

Star City—Mayor, J. W. Kennedy; recorder, C. F. Brewer.

## PROBLEMS CITIES ARE STUDYING WITH EXPERTS

Rice Lake, Wis., is to construct a new BRIDGE from plans and specifications prepared by J. H. A. Bratz, 312 Commercial Building, St. Paul, Minn.

A number of STREET IMPROVEMENTS are to be made by the city of Stanberry, Mo. Black and Veatch, 507 Interstate Building, Kansas City, Mo., are engineers for the work.

A SANITARY SEWER SYSTEM to cost \$150,000 is planned for the village of LeRoy, N. Y. The engineer, James P. Wells, 344 Butler Building, Rochester, N. Y., is preparing plans and specifications.

In constructing a WATERWORKS SYSTEM, including pumping station, filtration plant and mains, Oneonta, N. Y., is to use plans and specifications prepared by Clyde Potts, consulting engineer, 30 Church street, New York, N. Y.

McCracken, Kans., has voted bonds for the construction of an ELECTRIC LIGHT PLANT and WATERWORKS to cost \$30,000. The engineers for the project are W. B. Rollins & Co., 209 Railway Exchange Building, Kansas City, Mo.

The city of Memphis, Tex., is planning a number of PAVING IMPROVEMENTS, involving \$90,000. Henry Exall Elrod, Interurban Building, Dallas, Tex., has been retained as consulting engineer.

In constructing its new WATER SYSTEM at a cost of \$180,000, Winchester, Ky., has the engineering services of E. B. Kay, Colonial Building, Winchester, Ky.

The village of New Bremen, O., is to make a number of PAVING IMPROVEMENTS, George Champe, 610 Nasby Building, Toledo, O., being engineer for the work.

In making PARK IMPROVEMENTS to cost \$20,000, Topeka, Kans., has retained as landscape architect, C. D. Cuthbert, 435 Kansas avenue, Topeka, Kans.

Springfield, Mo., is to construct a municipal LIGHTING PLANT, to cost \$400,000. The engineers for the work are Stevens and Stiles, 222 Commerce Building, Kansas City, Mo.

St. Augustine, Fla., is to have a CITY PLAN developed to control the beautifying of the city. Myron H. West, president of the American Park Builders, 140 South Dearborn street, Chicago, Ill., is now making a preliminary survey.

Rockford, Ill., is studying the question of GARBAGE DISPOSAL. Samuel A. Greeley, of the firm of Pearse & Greeley, 64 West Randolph street, Chicago, Ill., has been retained as consulting engineer to assist the council committee in the work.

## INDUSTRIAL NEWS

**Cast Iron Pipe.**—Chicago—A quiet week is reported by the pipe companies and new inquiry is limited. At Pontiac, Mich., 1,200 tons will be bought, while Springfield, Ill., is also in the market. Quotations: 4-inch, \$44.50; 6-inch and larger, \$41.50; class A, \$1 extra. Birmingham—The booking of an order for 1,500 tons by the National Cast Iron Pipe Company at St. Paul was the leading event of the week. The American Cast Iron Pipe Company will build a two-mile railroad to haul molten iron from the furnaces of the Republic Company to its North Birmingham pits, the experiment in the use of hot metal having been successful. A fair sprinkling of orders, in spite of high prices, was stimulating. Quotations: 4-inch, \$39; 6-inch and upward, \$36; special lengths, \$1 extra. San Francisco—Business is decidedly dull, the last advance having caused a general suspension of buying. Local corporations have many large improvements planned for the year, but are unwilling to buy except for actual necessities under present conditions. Quotations: 6-inch, \$49; \$52 for 4-inch, and \$1 extra for class A. New York—The city of Baltimore has opened bids on the general requirements of the water department to June 30, 1917, with no mention of a definite quantity. Municipal lettings are few at present, and the volume of private business is diminishing. Quotations: \$41.50 for 6-inch, class B and heavier; \$42.50 for class A.

**Lead.**—Prompt lead is scarce and stronger. Quotations: New York, 7.65 cents; St. Louis, 7.50 cents.

**The Goodyear Tire & Rubber Co., Akron, O.**, announces that Mr. F. N. Hammond, recently branch manager at Youngstown, O., has been made branch manager at Cleveland, succeeding R. S. Hartzell, who has been placed in charge of manufacturers' business in Cleveland and vicinity, under the jurisdiction of the Detroit district office. Hartzell's headquarters will continue at Cleveland.

**Traffic-Police Equipment in Brazil.**—Police officials here have manifested considerable interest in magazine articles describing the management and equipment of the traffic police of New York and other American cities. Requests have been made for models or designs or illustrations of the weighted stands used for roping off crowds and for making ways for wheeled traffic, as well as of police semaphores. A semaphore, in order to win favor here, should be rather ornate in design to match the handsome bronze electroliers of the street corners. It should have arms bearing the devices adopted by the Automobile Club of Brazil to indicate "right," "left," "stops," etc., upon colored backgrounds, that might be illuminated by electricity at night. Some

device, perhaps an awning, to protect the policeman who stands beneath the semaphore from the tropical sun might be required here. Firms dealing in these or any other forms of modern, up-to-date police equipment are invited to address the American consulate general at Rio de Janeiro, Brazil, marking their catalogues on the wrapper "Department B." Catalogues unaccompanied by price and discount lists are unlikely to have much value here.

**The East Iron & Machine Co., Lima, O.**, announces that the following concerns have recently purchased "Merri-man" one-car railroad asphalt plants: H. G. Goelitz Co., Oak Park, Ill.; Columbus Paving Company, Columbus, O., and Andrews Paving Company, Hamilton, O.

**The Northwestern Steel and Iron Works, Eau Claire, Wis.**, reports that the United States Government, Panama Canal Division, purchased for work at Colon, four No. 610 Northwestern mixers with a capacity of 10 cu. ft. on May 2, 1916. So well satisfied have the Panama Canal engineers been with the purchase of last May that they recently ordered four more of the same size and capacity for work on the other end of the Canal Zone. This last shipment was sent forward to Panama December 28, 1916.

**Record Output of Lead.**—The United States Geological Survey, Department of the Interior, has just published the New Year estimate of the production of lead in 1916. In the production of lead ore there was a gain of 10 per cent. over the preceding year, the lead content of ore mined in 1916 being estimated at 622,000 short tons. Missouri had the largest production and also made a gain of over 25,000 tons. Good gains were made by California, Idaho, Nevada, Utah, and New Mexico. The production of refined lead, desilverized and soft, from domestic and foreign ores, was approximately 579,600 tons, worth at the average New York price \$78,826,000, as against \$50,055, worth \$51,705,000, in 1915.

The output of antimonial lead was about 21,800 tons, worth about \$4,283,000. The domestic production was made up of 324,000 tons of desilverized lead and 234,209 tons of soft lead, worth in all about \$75,915,000, and the production from foreign ores is estimated at 21,400 tons. The imports of lead in all forms were about 35,800 tons, and the exports were about 117,550 tons, of which 108,200 tons were derived from domestic ores. The total exports of lead were valued at about \$15,832,000. The consumption of lead, as near as it can be calculated, disregarding stocks of domestic lead, was 471,200 tons, as against 426,751 tons in 1915. The price of lead was nearly 50 per cent. higher in 1916 than during the preceding year, the average of spot quotations at New York being 6.8 cents a pound, as compared with 4.7 cents in 1915.

The city council of Sioux City, Ia., has authorized the purchase of a White motor driven street flusher, made by The White Company, Cleveland, O.

## TRADE LITERATURE

**The Sun Company**, 1428 South Penn Square, Philadelphia, Pa., is publishing a series of monthly pamphlets on the progress of the oil industry and the history of its own oil business. The booklets are very handsomely gotten up, interestingly written and strikingly illustrated. The first was "Historical," the second dealt with "Production," the third with "Pipe Lines and Terminals" and the fourth with "Refining."

**The Alpha Portland Cement Company**, Easton, Pa., has just issued a splendid new book on "Alpha Cement—How to Use It." A list of topics treated seems to cover the whole range of concrete construction and every subject is illustrated with clear drawings and blueprints and striking photographs. Detailed specifications and valuable hints and methods for economy and efficiency in construction abound throughout the book. Very useful tables, giving good data on materials, are a special feature of the volume. Among the matters of construction treated are concrete blocks, bridges, colored concrete, culverts, curbs, dams, forms, foundations, gutters, pavements, pump platforms, roads, retaining walls, septic tanks, sidewalks and water tanks. The phases of concrete work discussed include aggregates, ashes in concrete, bank-run gravel, broom dash finish, bush hammering, specifications and tests, cinders, crack prevention, curing, prevention of dampness, density, fireproofing, protection of fresh concrete, hand mixing, hardening, cold-weather concreting, hydrated lime, lime, pebbles, placing, porosity, proportions, reinforcing, sand, slag, surface hardeners and waterproofing. This convenient hand book on concrete should prove a valuable and oft-referred to addition to any library on the subject.

The uses of open heaters in connection with the heating, metering and softening of water for boiler and other purposes are exhaustively treated in a 100-page book (publication No. 710) lately issued by the **Harrison Safety Boiler Works**, Philadelphia, Pa. The amount of fuel that can be saved by the use of exhaust steam to heat feed water is first explained, and a convenient diagram is given by which the percentage of fuel saving in any given case can be easily ascertained. The essential parts of an open feed water heater are then considered, after which there are chapters on heating boiler feed in condensing steam power plants, the effects of open heaters in connection with exhaust steam heating and drying systems, exhaust steam heating in connection with condensing steam power plants, the utilization of the open feed

water heater as part of a hot process water softener, by which means, it is claimed, more complete and rapid removal of scale-forming matter is obtained, the subject of softening boiler feed water in condensing power plants, the metering of feed water in open heaters and the heating of water for purposes other than boiler feed. Finally, there is a point by point comparison of the open heater, as represented by the Cochrane Feed Water Heater, with the closed or pressure type of heater. This book covers in a very complete manner the important matters of handling feed water and exhaust steam, and should be of value to those who design, manage or operate steam power plants.

**The Spray Engineering Company**, 93 Federal street, Boston, Mass., has just issued a new bulletin, No. 250, dealing with "Spraco" equipment for washing and cooling the ventilating air for steam turbine-driven generators. The whole subject is carefully treated and the tables, charts, diagrams and photographs add greatly to the value of the work. The bulletin is attractively printed and should prove popular with those interested in the subject.

#### NEWS OF THE SOCIETIES

(Continued from page 114.)

markable benefits it has already contributed to dwellers in the densely crowded portions of Manhattan island. More than 450,000 motor cars entered this park last summer, said Mr. Welch, and on Labor day there were 2,270 parked at one time.

Speakers at the afternoon session, the topic for which was the wild life of the parks, were John B. Burnham, president American Game Protective and Propagation Society; Charles Sheldon, chairman game preservation committee, Boone and Crockett Club; Henry S. Graves, chief, forest service; E. W. Nelson, chief of bureau of biological survey; E. Lester Jones, superintendent coast and geodetic survey, and T. S. Palmer, assistant in charge of game preservation, bureau of biological survey.

#### Ohio Engineering Society.

The thirty-eighth annual meeting of this society will be held at Brown Hall, Ohio State University, Columbus, Jan. 31 and Feb. 1 and 2. Officers, trustees and committees will meet Wednesday morning. In the afternoon president Thompson of the University will deliver the address of welcome. W. A. Alsdorf will tell of the work of the Ohio Good Roads Federation and the legislative committee will report.

At the Thursday morning session L. H. Hart, of Buffalo, will describe the New York State Barge Canal and L. N. Waid will speak on "The Completion of the National Road Through Ohio."

In the afternoon will be the reports of the secretary and the nominating

committee and the election of officers. R. T. Richardson will describe the new Scioto river bridge and W. J. Watson will describe monumental and historical bridges.

At the evening session at 7.30 o'clock the following will be presented: "Co-operation Among Engineering Organizations," by Prof. F. H. Newell, University of Illinois, former chief of the U. S. Reclamation Service, and "Publicity for the Engineer," C. E. Drayer, secretary Cleveland Engineering Society.

Friday morning, 9 o'clock—"The Status of the Engineer Under the Ohio Laws," W. J. Sherman, consulting engineer, Toledo, O.; "Flood Prevention Plans for the Miami Valley," Arthur E. Morgan, chief engineer, Miami Conservancy District.

1.30 o'clock—"The Operation of the Activated Sludge Type of Sewage Plant," Geo. B. Gascoigne, city sanitary engineer, Cleveland, O.; "The Work of the City Manager," K. B. Ward, city manager, Sandusky, O.; "Method of Applying Surface Treatment in Highway Construction of the Barrett Company."

#### Idaho County Commissioners.

The eighth annual convention of county commissioners of Idaho, at the meeting held at Boise, Dec. 18 and 19, passed a resolution "that our association immediately recommend that provision be made by the legislative for calling a constitutional convention, that we may do away with obsolete laws and place our counties in position for handling affairs by modern, up-to-date, business methods."

That the average cost of the primary election is more than \$100 per precinct, or \$80,000 for the entire state, there being 800 precincts, and that in one precinct the cost of the primary per vote was more than \$20, and in several the "glorious privilege of voting at the primary" cost the taxpayers between \$10 and \$18 per vote, were statements made Tuesday afternoon by M. H. Coffin, Ada county commissioner, in addressing the convention of the county commissioners on "Elections and What They Cost."

Mr. Coffin said his figures were as nearly accurate as it was possible for him to make them from the data he obtained on the cost of the recent primary for the different commissioners. His figures, made up from a chart that he exhibited, were not challenged, and he expressed the opinion that the taxpayers would not favor the state-wide primary law when they learned it cost them an average of \$1.40 for every vote at the primary election.

C. B. Ross of Canyon county at the morning session did not discuss "Duties of Commissioners," the subject slated on the program, but having been named chairman of the legislative committee talked on proposed legislation and urged a change in the revenue law as to the reassessing and the collecting of personal taxes. T. A. Wal-

ters, attorney general elect, who was on the program for a talk, was unable to be present.

Carl Feldhusen of the Ada county assessor's office suggested various tax reforms. He said:

"The term, 'cash value' is the yardstick by which we measure our values and there should be no doubt as to its interpretation. I want to warn you, gentlemen, that we are getting away from the law. The cry that 'high valuations means high taxes' is deceptive.

"I wish to propose that no bonds be voted by any taxing district unless a provision is made that they commence to be redeemed one year after their issue.

"The state board of equalization meets once a year for about two weeks. With all due respect to the wisdom and integrity of our state officers constituting this board, I want to say that no human beings can in this short time do the work they are expected to do intelligently and fairly. The last legislature decided to do away with the tax commission. I do not want to criticise this act, but I do think a provision should have been made to put in its place some competent official, who works as an assistant to the board of equalization and gathers data.

"I recommend that corporations be required to file maps with their annual reports, showing the location and mileage of their lines in each county.

"The distribution of the money derived from the taxation of these public utilities also needs adjustment. It is not right that one district is compelled to levy a dollar for special school taxes, when another district that happens to have a large railroad valuation has plenty of funds for a first class school with a 10 cent levy. The money derived from these sources for school purposes should be divided according to population or school attendance over the whole state."

Other reforms Mr. Feldhusen recommended were in the figuring of mileage on private car lines, in the migratory stock law and the assessment of banks.

Edward Smith, Ada county, presented the report of the legislative committee. The committee reported that it favored the creation by legislative enactment of a law providing a uniform system of accounting, auditing and reporting in all governmental units of the state. Such a law will be drafted on behalf of the committee and presented to the legislature.

They recommended the wisdom of inaugurating annual meetings of county auditors.

Reorganization of county government for the purpose of rendering it a more efficient business unit is recommended and as an initial step in such reorganization they favor an amendment to the constitution providing that the term of county commissioners be extended to six years and that the bill be so drawn that two commission-

ers be elected every two years, one for the four-year term and the other for the two-year term, and that all salaries and bills may be allowed monthly.

Relative to the collection of personal taxes an amendment is suggested to the revenue laws and the assessment and exemption of bank stock.

Officers elected for two years follow: President, John L. Woody, Latah (re-elected); vice president, Edward Smith, Ada; secretary, C. B. Ross, Canyon (re-elected); treasurer, J. S. Boone, Ada.

#### Conference of Municipal Utility Officials.

City officials and superintendents of municipally owned utilities of Indiana organized a state association at a meeting held at the Hotel English, Indianapolis, Jan. 9, for the purpose of improving conditions in municipally owned plants and to procure any legislation that might be necessary for the benefit of cities that own and operate such utilities.

Frank J. Dix, of Ft. Wayne, Ind., was elected president of the organization, and John J. Alt, of Ft. Wayne, was elected secretary-treasurer. Other officers elected follow: First vice-president, F. Kleineknecht, of Richmond; second vice-president, F. H. Miller, of Crawfordsville, and members of the board of directors to serve with the above named officers, L. A. Stephens, of Anderson; A. T. Mahon, of Rushville; F. L. Good, of Winamac; Charles Streithof, of Evansville, and V. A. Harding, of Goshen.

The officers and members of the board of directors were instructed to hold a meeting for the purpose of drafting a constitution. The name of the association has not been selected.

The meeting was called to order by William J. Hosey, mayor of Ft. Wayne, who outlined at length the benefits that might follow the organization of such an association. He said the utility law should be amended to give local governments the authority to regulate problems arising in municipally owned utilities.

The following city officials and superintendents of municipally owned plants attended: William J. Hosey, mayor of Ft. Wayne; J. G. McClellan, mayor of Auburn; Clata L. Bebout, mayor of Rushville; Charles Christen, mayor of Decatur; William B. Reed, mayor of Attica; John Wessel, Jr., of Ft. Wayne; V. A. Harding, of Goshen; Charles Streithof, of Evansville; F. L. Good, of Winamac; B. H. Freeland, of Tell City; C. F. Smith, of Union City; Frank J. Dix, Arthur Herren and G. C. Anderson, of Peru; O. L. Fawley, of Ft. Wayne; F. H. Miller, of Crawfordsvills; John J. Alt and R. J. Gaskill, of Ft. Wayne; G. C. Anderson, of Crawfordsville; W. H. Brandon and L. A. Stephens, of Anderson; J. S. Gardner, of Huntington; A. T. Mahon and Charles P. Mauzy, of Rushville.

#### Oregon Commonwealth Conference.

The annual conference was held January 3d and 4th under the auspices of the University of Oregon, Portland. The road situation was discussed and the following papers presented: "Defects in Oregon's Present Road Laws," Rufus C. Holman, president Association of County Judges and Commissioners; "Classification of Oregon Roads, and Total Mileage and Distribution of State Soads," John H. Lewis, state highway engineer; "Roads Within and Adjacent to National Forests in Oregon," B. J. Finch, senior engineer U. S. forest service.

"The Development of the Agricultural and Scenic Resources of the Pacific Northwest Through Good Roads and Their Use in Military Defense," R. H. Thomson, formerly city engineer, Seattle; "Organization for Highway Work," Paul D. Sargent, state highway engineer; "Maine's Methods of Accounting for all Road Expenditures and Need of Authority to Enforce," J. C. Ainsworth, U. S. National bank, Portland; "Maintenance of Highways—Organization, System and Methods," F. W. Sarr, deputy highway commissioner, New York; "Factors in Oregon Conditions Making For and Against the Selection of the Different Types of Pavements and When Paving Is Justifiable," J. W. Cunningham, member of American Society of Civil Engineers; "General Road Policies Advisable for Construction of State Roads," A. G. Johnson, department of public works, Portland.

"The Highway as an Investment," Dr. L. I. Hewes, engineer in charge of first district for federal grant of aid to highways; "Lessons From the Experience of California in Establishing System of State Highway Construction and Maintenance," Austin B. Fletcher, state highway engineer, California; "Necessity for Testing All Materials Used in Road and Bridge Construction," Prof. S. H. Graf, Oregon Agricultural College; "Necessity of Eliminating Railroad Grade Crossings Before Permanent Paving," F. J. Miller, Oregon public service commissioner; "How Cost of State, County and District Roads Can Be Equitably Placed Upon Those Who Use Them and All Benefited by Them," C. E. Spence, master state grange, Oregon.

#### Idaho State Firemen's Association.

Pursuant to a call of the fire department head a meeting was held at Jerome, Idaho, Dec. 1, at which time preliminary steps were taken looking to the organization of a State Fireman's association. Fifteen different fire departments were presented at the meeting, either in person, by proxy or letter.

The purpose of the new association in this state is the securing of legislation of interest to firemen, the holding of state conventions and tournaments, where these interests may be discussed.

The towns represented at this meeting were Ashton, Burley, Caldwell, Gooding, Idaho Falls, Jerome, Kellogg, Mullan, Pocatello, Rexburg, Rupert, Sandpoint, Spirit Lake, Wardner and Weiser. Officers of the association were elected as follows: R. W. Burroughs, Jerome, president; George C. Westwitt, Kellogg, first vice president; O. Royce, Caldwell, second vice president; Fred Carlson, Twin Falls, third vice president; L. M. Salvage, Burley, secretary-treasurer.

A committee on by-laws and constitution was selected as follows: Charles J. Upham, chairman, Rexburg; L. B. Bedford, Rupert, Harry Levy, Gooding; Julius Marker, Idaho Falls; T. W. Rush, Ashton.

A legislative committee was also selected, consisting of T. Bailey Lee of Burley as chairman, and A. B. Canfield, Pocatello; E. B. White, Jerome; Charles Snyder, Buhl, and H. M. Kuhlman, Weiser.

#### Connecticut Good Roads Association.

Frank T. Staples of Bridgeport was elected president of the Connecticut Good Roads association, at its annual meeting held at New Haven, January 2. Other officers chosen were: Vice-presidents, Don C. Seitz, New York; Philip Pond, New Haven; Frank J. King, Norwich; secretary, Charles M. Robinson, New Haven; treasurer, D. A. Adams, New Haven. Proposed legislation for better roads was discussed.

#### Oklahoma Society of Engineers.

Alfred Boyd, dean of the school of engineering of Agricultural and Mechanical College at Stillwater, has been elected president of the Oklahoma Society of Engineers. Other officers elected are M. L. Cunningham, Oklahoma City, state engineer, first vice president; F. B. King, Lawton, second vice president; J. P. Cloutz, Muskogee, third vice president, and H. V. Hinckley, Oklahoma City, secretary-treasurer.

#### County Auditors' Association of Indiana.

Officers for the County Auditors' Association of Indiana were elected at the annual meeting held at Indianapolis, January 9, as follows: Edward Simon, of Gary, president; J. F. Lochard, of Versailles, vice-president, and George W. Baxter, of Lafayette, secretary-treasurer.

A legislative committee was selected as follows: Charles P. Beard, Evansville; J. I. Muentzer, Vincennes; Preston M. Stephenson, Paoli; J. F. Lochard, Versailles; W. O. Graeser, Brazil; Lewis S. Bowman, Richmond; Leo K. Fesler, Indianapolis; Charles E. Tillson, Winchester; H. W. Newlin, Covington; Samuel H. Sizelove, Kentland; A. P. Flinn, Logansport; Will Johnson, Ft. Wayne, and E. A. Smith, Rochester.

The following members at large were elected: George W. Baxter, Lafayette; Thomas Ferguson, Terre Haute; Edward Spray, Frankfort, and Cleveland Goodwin, Lebanon.

# ADVANCE CONTRACT NEWS

## ADVANCE INFORMATION BIDS ASKED FOR

## CONTRACTS AWARDED ITEMIZED PRICES

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also correction of any errors discovered.

### BIDS ASKED FOR

STATE	CITY	RECD UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
<b>STREETS AND ROADS.</b>				
N. Y., Buffalo	11 a.m., Jan. 26.	Furnishing bitumen, paving stone, sand, curbs, gravel, broken stone, etc., for one year.	A. W. Kreinheder, Comr. Pub. Works.	
Ky., Salyersville	Jan. 26.	Co. road work; cost, \$30,000.	Co. Comrs.	
Va., Clintwood	Jan. 26.	County road work, cost \$60,000.	County Clerk	
O. Gallipolis	Jan. 26.	Street paving	L. C. Bean, Dir. Pub. Service	
N. Y., N. Y. (Bronx)	10:30 a.m., Jan. 26.	Laying sidewalks and constructing approaches	Douglas Mathewson, Borough Pres.	
Mo., Stanberry	7 p.m., Jan. 26.	1,500 sq. yds. brick pavement and 3,000 ft. concrete curb and gutter	Black & Veatch, Engrs., Inter-state Bldg., Kan City, Mo.	
Ky., Earlington	Jan. 28.	Three miles of road, \$15,000 available.	City Clerk	
O. Ravenna	Jan. 28.	1,700 sq. yds. of brick pavement, slag base and stone or concrete curb	S. B. Horsfall, Dir. Pub. Serv.	
Ind., Winchester	10 a.m., Jan. 28.	Grading, paving and improving road.	C. E. Tillson, Co. Aud.	
N. J., Layton	1 p.m., Jan. 29.	Grading with gravel surface.	F. W. Tooker, Engr.	
Fla., Gainesville	Jan. 29.	Laying 15,000 sq. yds. brick pavement	H. E. Taylor, B. of Pub. Wks.	
Ind., Lebanon	Jan. 29.	Thirteen blocks brick pavement, cost \$25,000.	Walter Whitecotton, City Eng.	
Ky., Hindman	Jan. 29.	Macadam street work; cost, \$40,000.	City Engr.	
Ind., Evansville	10 a.m., Jan. 29.	Constructing county roads	C. P. Beard, Co. Aud.	
Ind., Winchester	10 a.m., Jan. 29.	Constructing county highway	C. E. Tillson, Co. Aud.	
Minn., St. Paul	10:30 a.m., Jan. 29.	20,000 brick paving blocks; 50,000 cement cross-walk blocks; 6,000 18-in. cement tile; 10,000 24-in. cement tile; 1,950 cu. yds. crushed limestone and 61 cars crushed granite or trap.	H. W. Austin, Pur. Agent.	
Minn., Minneapolis	3 p.m., Jan. 29.	Furnishing 400,000 vitrified paving blocks; 500,000 to 1,000,000 gallons asphaltic road oil.	K. E. Alexander, Pur. Agt.	
Ind., South Bend	10 a.m., Jan. 30.	Pavement on Portage Court	Board of Public Works.	
Ia., Sheldon	Jan. 30.	Constructing 31,600 sq. yds. first-class pavements	M. V. Norris, City Engr.	
Wis., Whitewater	2 p.m., Jan. 30.	Paving with wood, asphalt or concrete.	A. N. Savee, City Clerk.	
Md., Baltimore	noon, Jan. 30.	6.93 miles concrete highway; 780-ft. bridge over Sassafras River	State Roads Commission.	
Pa., Wilkes-Barre	noon, Jan. 31.	Creosoted roadway and sidewalk on bridge.	F. R. Hendershot, Co. Compt.	
Va., Wise	Jan. 31.	Street work in 1917, \$50,000 available.	City Comrs.	
Fla., Jacksonville	4 p.m., Jan. 31.	2,575 square yards asphaltic, concrete pavement and 254 square yards vitrified block gutter.	Comr. of Public Works, Highway Department, Main and Orange Sts.	
O. Springfield	noon, Jan. 31.	Paving streets, 9 jobs; cost, \$115,000.	C. E. Ashburner, City Mgr.	
Mass., Lawrence	2 p.m., Feb. 1.	9,344 sq. yds. granite block pavement on bridge.	J. J. Donovan, Chrmn. Bridge Commission.	
N. J., Flatbrookville	Feb. 1.	30,000 sq. yds. gravel road.	Eug. Rosencranz, Com. Chmn.	
Ark., De Queen	Feb. 1.	Constructing and bridging 27 miles of gravel road.	Parks Engrg. Co., Pine Bluff	
N. J., Newark	3:30 p.m., Feb. 1.	300 tons asphaltic cement, 200 tons stone dust, 300 tons Portland cement and 2,000 cubic yards broken stone.	M. R. Sherrerd, Chief Engr.	
Mich., Zeeland	2 p.m., Feb. 1.	Laying first class pavement.	D. F. Boonstra, City Clerk.	
O., Urbana	Feb. 1.	Paving West Jefferson Rd.	W. S. Coffey, Co. Aud.	
Ia., Cedar Rapids	Feb. 1.	Paving thirteen blocks; cost, \$90,000.	T. F. McCauley, Engr.	
Ill., Cicero	Feb. 1.	8,290 sq. yds. asphaltic concrete pavement, and 5,800 feet concrete curb	Lewis Mangraig, Engr.	
Va., Appalachia	Feb. 1.	Street improvement; \$80,000 available.	City Comrs.	
Mich., Zeeland	2 p.m., Feb. 1.	Paving with brick, sheet asphalt, asphaltic concrete, asphalt block or concrete.	City Clerk.	
Ill., Lincoln	Feb. 1.	Paving streets; cost, \$70,000.	W. C. Bates, City Engr.	
Ind., Bluffton	10 a.m., Feb. 1.	Constructing stone roads.	Will. Johnston, Co. Aud.	
N. Y., Gowanda	Feb. 1.	13,000 sq. yds. concrete pavement.	F. J. Herzog, Clerk.	
Ky., Olive Hill	Feb. 1.	Improving streets, \$40,000 available.	City Clerk	
O., Cincinnati	noon, Feb. 1.	Macadam road work; cost, \$6,000.	W. H. Boeh, Co. Engr.	
N. J., Pohatcong	2 p.m., Feb. 1.	7,000 sq. yds. road work.	F. L. Pursell, Twp. Clk.	
N. J., Belvidere	Feb. 1.	7,000 sq. yds. pavement.	State Comr. of Public Roads, Trenton	
Tex., Mt. Vernon	noon, Feb. 1.	Constructing highway system complete.	Judge Reeves, Co. Judge.	
Ind., Jeffersonville	10 a.m., Feb. 1.	Constructing macadam road.	G. W. Stoner, Co. Aud.	
Ind., Brownstown	1 p.m., Feb. 1.	Three concr. roads, one tarvia mac. and one gravel.	Albert Luedtke, Co. Aud.	
Minn., Montevideo	Feb. 1.	17,537 sq. yds. of wood block pavement and 660 sq. yds. concrete or bitulithic pavement.	B. O. Bonn, City Clerk.	
Ind., Williamsport	9 a.m., Feb. 1.	Constructing 4,033 ft. of gravel road in Liberty Twp.	E. W. Edwards, Aud.	
Ind., Kentland	2 p.m., Feb. 1.	Constructing macadam road in Beaver Twp.	S. R. Sizelove, Co. Aud.	
Cal., Berkeley	10 a.m., Feb. 1.	Paving streets.	G. E. Gross, Clerk, Co. Supvrs.	
Ind., Connerville	2 p.m., Feb. 1.	Constructing gravel road.	Glen Zell, Co. Aud.	
Ind., Greenfield	10 a.m., Feb. 1.	Constructing stone roads.	H. J. Rhue, Co. Aud.	
Ind., Versailles	noon, Feb. 1.	Constructing stone roads.	J. F. Lochar, Co. Aud.	
Ind., Cannelton	noon, Feb. 1.	Constructing macadam road.	M. C. Conway, Co. Aud.	
Ind., Rushville	2 p.m., Feb. 1.	Two miles of macadam road.	W. H. McMillin, Co. Aud.	
Miss., Port Gibson	Feb. 1.	Six miles concrete sidewalk.	City Clerk.	
Ind., Evansville	10 a.m., Feb. 1.	Constructing county road.	C. P. Beard, Co. Aud.	
Ind., Franklin	2 p.m., Feb. 1.	One and one-quarter miles gravel road.	John Gregg, Co. Aud.	
Miss., Natchez	Feb. 1.	Improving Upper River Road.	H. B. Vaughan, Pres. Bd. of Supervisors.	
Cal., Oakland	10 a.m., Feb. 5.	Paving on San Pablo Ave.	G. E. Gross, Co. Clk.	
Kan., Leavenworth	5 p.m., Feb. 6.	45,000 sq. yds. tar macadam; cost, \$66,150.	H. A. Perkins, City Engr.	
Ill., Berwyn	8 p.m., Feb. 6.	Paving with asphaltic concrete.	O. M. Lindahl, Sec. B. L. I.	

## BIDS ASKED FOR

STATE	CITY	RECD UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Ky., Inez	Feb.	6.. Improving several streets.	City Clerk	
Ky., Grayson	Feb.	6.. Street improvement, \$125,000 available.	City Engineer.	
Wash., Friday Harbor	1 p.m., Feb.	6.. One mile of road on Lopez Island.	County Engineer.	
Fla., Perry	10 a.m., Feb.	6.. Constructing 87 miles of improved highways.	J. C. Calhoun, Clerk, County Commissioners.	
Ind., Logansport	10 a.m., Feb.	6.. Constructing county road.	A. P. Flynn, Co. Aud.	
Ind., Delphi	noon, Feb.	6.. Two gravel and macadam roads.	H. D. Good, Co. Aud.	
Ind., Mt. Vernon	2 p.m., Feb.	6.. Stone and gravel roads.	J. R. Haines, Co. Aud.	
Ind., Wabash	10 a.m., Feb.	6.. Five gravel and two stone roads.	F. P. Kircher, Co. Aud.	
Ind., Spencer	1 p.m., Feb.	6.. Two stone and gravel roads.	S. M. Royer, Co. Aud.	
Ind., Bedford	1 p.m., Feb.	6.. Constructing two gravel or macadamized roads, 8,775 and 10,987 ft.	D. H. Moffitt, Aud.	
Ky., Mt. Olivet	Feb.	6.. Road work during 1917, \$30,000 available.	County Clerk	
Ind., Kokomo	10 a.m., Feb.	6.. Constructing gravel and stone roads.	W. L. Benson, Co. Aud.	
Ind., Crawfordsville	10 a.m., Feb.	6.. Gravel and limestone roads.	Dr. W. F. Batman, Co. Aud.	
Ind., Rochester	2 p.m., Feb.	6.. Constructing stone roads.	E. A. Smith, Co. Aud.	
Ind., Corydon	2 p.m., Feb.	6.. Constructing macadam roads.	Sam C. Mauck, Co. Aud.	
Ind., Brazil	10:30 a.m., Feb.	6.. Constructing two stone and gravel roads.	W. O. Graeser, Co. Aud.	
N. J., Neshanic	Feb.	6.. 12,000 sq. yds. macadam pavement.	C. Van Cleef, Clerk, Twp. Committee.	
Ind., Auburn	10 a.m., Feb.	7.. Constructing stone road.	S. P. Nelson, Co. Aud.	
Ind., Lafayette	10 a.m., Feb.	7.. Constructing stone road.	G. W. Baxter, Co. Aud.	
Ind., Wabash	10 a.m., Feb.	7.. Creosote block floor on bridge.	F. P. Kircher, Co. Aud.	
Ind., Indianapolis	10 a.m., Feb.	8.. Constructing gravel roads.	L. K. Fesler, Co. Aud.	
Ind., New Albany	Feb.	8.. Road construction.	Emile Dupaquier, Co. Aud.	
Ind., Frankfort	2 p.m., Feb.	8.. Two and one-half miles gravel road.	Edward Spray, Co. Aud.	
Ky., Columbia	Feb.	8.. Street paving, cost \$30,000.	City Commissioners.	
Ind., Liberty	1 p.m., Feb.	10.. Constructing county line roads.	G. W. Wray, Co. Aud.	
Ky., Georgetown	Feb.	12.. Improving several streets.	City Clerk.	
N. J., Camden	11 a.m., Feb.	12.. Constructing gravel road.	J. J. Albertson, Co. Engr.	
Ky., Irvine	Feb.	12.. 1.5 mile state aid road construction.	J. A. Alexander, Co. Clerk.	
O., Cleveland	noon, Feb.	12.. Paving and improving streets in East View.	Pease Engineering Co., Marshall Bldg., Cleveland.	
Ill., East Dubuque	4 p.m., Feb.	13.. 1,550 sq. yds. brick pavement on bridge.	M. Tschirgi & Sons, Engrs., Amer. Trust Bldg., Cedar Rapids, Ia.	
Ky., Jamestown	Feb.	13.. Co. road work, \$50,000 available.	County Judge.	
Ky., Albany	Feb.	13.. Co. road work, \$40,000 available.	Co. Commissioners.	
W. Va., Charleston	Feb.	14.. Three miles hard surface road.	P. J. Walsh, Co. Engr.	
Ind., Noblesville	10 a.m., Feb.	15.. One concrete and six gravel roads.	W. O. Horton, Co. Aud.	
Ia., Hampton	Feb.	15.. 90,000 sq. yds. pavement and concrete curb.	T. S. DeLay, Engr., Creston.	
Pa., Newcastle	11 a.m., Feb.	15.. Six miles 16-foot concrete road.	T. A. Gilkey, Engr., Mercantile Bldg.	
Pa., Ruffsdale	10 a.m., Feb.	15.. Grading and macadamizing.	James M. Baker.	
Wis., Waupun	1:30 p.m., Feb.	15.. 15,000 sq. yds. hard surface pavement.	E. B. Parsons, Engr., Jefferson.	
Ky., Indian Bottom	Feb.	16.. Constructing roads, \$25,000 available.	City Commissioners.	
Ind., Brazil	10:30 a.m., Feb.	16.. Stone and gravel road.	W. O. Graeser, Co. Aud.	
Ind., South Bend	11 a.m., Feb.	19.. Constructing concrete roads.	A. F. Wolf, Co. Aud.	
Cal., Stockton	Feb.	19.. Constructing three streets.	E. D. Graham, Clerk	
W. Va., Parkersburg	Feb.	21.. 22,000 sq. yds. brick pavement.	T. L. Higgs, City Engr.	
Va., Grundy	Feb.	22.. Improving streets, cost \$25,000.	City Clerk.	
W. Va., Fayetteville	Feb.	26.. Macadam, brick, concrete and asphaltic concrete road improvement; cost, \$950,000.	K. J. McGrath, Engr., Mt. Hope.	
N. B., St. John	Feb.	26.. 400 tons of asphalt.	G. F. Fisher, Comr. of P. Wks.	
Conn., Manchester	March	1.. Concrete walks and curbs, cost \$23,000.	J. F. Bowen, Town Engr.	
O., Cadiz	March	15.. County road work; cost, \$16,000.	County Clerk.	
Ill., Canton	Mar.	30.. Road work, \$20,000 available.	E. F. Motsinger, Co. Highway Supt.	
Ill., Virginia	April	1.. Road improvement; cost, \$14,000.	Co. Clerk.	
SEWERAGE.				
Mich., Detroit	10 a.m., Jan.	26.. Constructing sewage pumping unit.	G. H. Fenkell, Comr. Pub. W.	
Mich., Flint	Jan.	26.. Constructing sewers and pavements.	E. C. Shoecraft, City Engr.	
O., Dayton	Jan.	26.. Sewer construction, cost \$65,000.	F. O. Elchelberger, City Engr.	
O., Hamilton	Jan.	26.. Sanitary sewers in four streets.	Dept. of Service.	
Pa., Erie	10:30 a.m., Jan.	26.. Constructing tile sewers; about 1,900 ft.	F. G. Lynch, City Engr.	
Minn., Granite Falls	1:30 p.m., Jan.	27.. Tile drainage ditch; cost, \$22,000.	G. H. Wilson, Co. Aud.	
Minn., St. Paul	10:30 a.m., Jan.	29.. Constructing several sewers.	H. W. Austin, Pur. Agt.	
Minn., New Ulm	Jan.	29.. 10,000 ft. tile drainage ditch.	L. G. Vogel, Co. Aud.	
Cal., Los Angeles	Jan.	29.. Sanitary sewers; cost, \$44,000.	Homer Hamlin, City Engr.	
Minn., Minneapolis	3 p.m., Jan.	29.. Furnishing sewer pipe and segment blocks.	K. E. Alexander, City Pur. Agent.	
Wis., Whitewater	2 p.m., Jan.	30.. Constructing storm sewers.	A. N. Savee, City Clerk.	
O., Springfield	noon, Jan.	31.. Constructing 4 sewer jobs; cost, \$37,564.	C. E. Ashburner, City Mgr.	
Kans., Pittsburg	4 p.m., Jan.	31.. Storm sewer, cost \$10,000 to \$15,000.	L. E. Curfman, City Engr.	
O., Cleveland	Jan.	31.. 3,100 ft. 12 to 24-in. drains.	W. A. Stinchcomb, Co. Surv.	
Ill., Cicero	Feb.	1.. 1,033 feet of sewers, cost \$2,100.	Lewis Mongreig, Engr.	
Wis., Milwaukee	Feb.	1.. 48 and 51-in. sewers.	J. H. Fowles, Secy Sewerage Commission.	
Minn., Buffalo	1 p.m., Feb.	2.. Constructing drainage ditches; cost, \$15,000.	J. A. Berg, Co. Aud.	
Ia., West Union	2 p.m., Feb.	2.. 20,000 ft. of sewers; cost, \$15,000.	City Clerk.	
O., Toledo	Feb.	2.. Constructing sanitary sewer.	Gabe Cooper, Co. Aud.	
Ind., Plymouth	2 p.m., Feb.	3.. Constructing tile ditch.	A. W. Thomson, Constr. Comr.	
Ia., Rockwell City	Feb.	5.. Disposal plant; \$10,000 available.	F. E. Burnham, City Engr.	
Minn., St. Peter	Feb.	5.. 18 miles of tile drain.	W. H. Holz, Co. Auditor	
Mich., E. Grand Rapids	Feb.	5.. One mile 10 to 30-in. sewers.	J. R. Rumsey, Engr., Grand Rapids.	
Ill., Berwyn	8 p.m., Feb.	6.. Vitrified tile sewer.	O. N. Lindahl, Sec. B. L. I.	
O., Columbus	Noon, Feb.	6.. Constructing large and small sewers.	G. A. Borden, Dir. Pub. Serv.	
Ga., Savannah	noon, Feb.	6.. 1,370 ft. concrete box storm sewer.	E. R. Conant, City Engr.	
Minn., Austin	10 a.m., Feb.	10.. Constructing tile drainage ditch.	O. J. Simmons, Co. Aud.	
O., East View	Feb.	12.. Storm and sanitary sewers.	C. J. Volk, City Clerk.	
O., Cleveland	noon, Feb.	12.. Storm and sanitary sewers in East View.	Pease Engrg. Co., Marshall Bldg.	
O., Wyoming	noon, Feb.	14.. Constructing several sewers.	G. H. Eversman, Village Clk.	
Ind., LaFayette	Feb.	14.. Sewer construction.	H. B. Overesch, Engr.	
Mont., Big Sandy	8 p.m., March	1.. Disposal plant, 1,850 ft. tile sewers, 600 ft. c. i. force main and pumping station with electric pumps.	Miracle Engrg. Co., Ford Bldg., Great Falls.	
Wis., Chilton	Mar.	6.. Constructing sewer system, cost \$22,000.	Jerry Donohue, Engr., Sheboygan, Wis.	
Ind., Shelbyville	March	6.. Constructing sewer.	City Engr.	
Ill., Hillsboro	April	1.. Constructing sewer system; cost, \$12,000.	W. A. P. Warren, City Engr.	
India., Calcutta	2 p.m., June	1.. Storm water pumping plant.	C. C. Chatterjee, Sec. Corp. of Calcutta.	

## BIDS ASKED FOR

STATE	CITY	RECD UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
<b>WATER SUPPLY.</b>				
Tex., Donna		Jan. 27.	Constr. reservoir and irrigation works.	G. Meriwether.
Ky., Pineville		Jan. 28.	Water works and street improvement, cost \$50,000.	T. J. Asher, Co. Judge
Wis., Milwaukee	10:30 a.m.	Jan. 31.	Furnishing gate and special or tapping valves.	F. G. Simmons, Comr. P. Wks.
Wyo., Pine Bluffs		Jan. 31.	Improving waterworks system.	K. Gardner, Supt.
N. Y., Mt. Morris	Feb. 1.		Sale of c. i. pipe and lead.	G. L. Bailey, Clk. Munic. Bd.
Cal., Coalinga	Feb. 1.		Constructing water system, cost \$100,000.	F. G. Desser, Engr., Central Building.
Minn., St. Paul	10:30 a.m.	Feb. 5.	Furnishing material for construction reservoir.	Engr., Bd. of Water Comrs.
Can., Winnipeg	noon	Feb. 5.	Indicating and recording apparatus for two Venturi meters.	R. D. Waugh, Chmn. of Comrs.
O., Columbus	Noon, Feb.	5.	400 tons bauxite ore.	G. A. Borden, Pres., Bd. of Purchase.
O., Geneva	Feb.	5.	Filter plant and sedimentation plant.	John Reeves, Supt. of Water Works.
Mich., Flint	2 p.m., Feb.	6.	Additions to purification plant.	Board of Water Comrs.
Va., Coeburn	Feb.	7.	Water works improvements.	City Commissioners
Nebr., Florence	4 p.m., Feb.	7.	Pumping station with capacity of 30,000,000 gallons per day.	R. B. Howell, Mgr.
S. D., Castlewood	Feb.	8.	8,000 ft. mains and elevated tank on 100-ft. tower.	Freed & Sours, Engrs., Water-town.
Minn., Thief Riv. Falls	8 p.m., Feb.	20.	2 12-inch wells, about 240 feet deep.	A. H. Fasel, City Clerk
Ill., Watseka	March	1.	7,500 ft. water main construction.	J. L. Smiley, Commissioner.
Ill., Springfield	Mar.	1.	3.5 miles 24-inch water main extension; cost, \$90,000.	City Engineer.
Mont., Big Sandy	8 p.m., March	1.	Pump station and pumps, 3,500 ft. 6-in. steel main and 100,000-gal. tank on 75-ft. tower.	Miracle Engrg. Co., Ford Bldg., Great Falls.
Wis., Chilton	Mar.	6.	Constructing water works system, cost \$45,000.	Jerry Donohue, Engr., Sheboygan, Wis.
O., Mt. Vernon	April	1.	Installing meters; \$20,000 available.	C. G. Snow, Dir. of Pub. Serv.
Ill., Gibson City	April	1.	Constructing water and light plant.	City Clerk.
<b>MISCELLANEOUS.</b>				
N. Y., New York	10:30 a.m., Jan. 29.		Furn. solid rubber tires, pipe fittings, drafting materials and miscellaneous supplies for the Fire Dept.	Robt. Adamson, Fire Comr.
Pa., Philadelphia	Jan. 29.		Constructing concrete dry dock at navy yard.	Bureau of Yards and Docks.
Cal., Summerland	Jan. 30.		Furnishing 3 4,000-ft. air blowers: 14 2 to 20-h. p. a. c. motors.	Navy Dept., Washington
D. C., Washington	Jan. 30.		Furnishing reinforcing material.	Board of Awards, Dept. of Agriculture, Wash., D. C.
N. J., Atlantic City	Feb. 1.		2 1,000-pound motor trucks.	Supt. of Prisons, Dept. of Jus.
N. Y., Buffalo	11 a.m., Feb.	5.	Motor tractor with power take-off; furnishing 2,000 to 2,250-gal. street flusher.	L. Van Gilder, City Engr.
Tex., Houston	Feb.	6.	Constructing 50 miles and canals and laterals, requiring about 650,000 cu. yds. of excavation; block and flume construction.	A. W. Kreinheder, Comr. of Public Works.
Pa., Philadelphia	Feb.	6.	Subway construction.	Cameron Co. Irrigation Dist., No. 1, Harlingen, Tex.
Ind., Monticello	1 p.m., Feb. 10.		Constructing two drainage ditches.	Wm. Twining, Dir. of City Transit.
Ind., Monticello	1 p.m., Feb. 10.		Constructing drainage ditch.	Paul Ward, Drainage Comr.
Ia., Estherville	noon, Feb. 12.		Constructing drainage ditches.	Geo. Thomas, Drainage Comr.
Minn., W. M'n'p'l's.	7:30 p.m., Feb. 13.		Constructing municipal gas plant.	J. J. Klopp, Co. Aud.
South Africa, Johannesburg	Feb. 15.		Machinery for utilizing by-products at municipal abattoirs.	E. A. Close, Recorder.
N. J., Washington	Feb. 19.		Lighting streets for five years.	Municipal Council.
La., Alexandria	8 p.m., March 7.		Levee constr., requiring 2,000,000 cu. yds. excav.	J. H. Hahn, Boro Clerk.
				Bd. of State Engrs., New Orleans Court Bldg., New Orleans.

## STREETS AND ROADS

**Eufaula, Ala.**—Fifteen or twenty thousand dollars is to be expended on the highway from Eufaula to the Bullock county line by way of Clayton and Mt. Andrew, a distance of 45 miles. This money will be furnished under the co-operative system of the federal government, the state and the county, and will be in charge of a government engineer. The route for the proposed improved road was decided upon by the Barbour county board of revenue. The new highway will give Eufaula direct connections with Montgomery, with good roads all the way.

**Pine Bluff, Ark.**—Several freeholders near Moscow and Tarry have signified their intention of petitioning the next general assembly to allow them to form a special road improvement district embracing Jefferson and Lincoln counties whereby they may build a 6-mile pike between Moscow and Tarry. The proposed road will connect the Star City and Tamo pikes. Only 1½ miles of the road is in Lincoln county.

**Fort Smith, Ark.**—Local highway enthusiasts are planning to co-operate with the Chamber of Commerce of Tulsa, Okla., in the construction of a highway from Fort Smith northwest to Pike's Peak, Colo. The road as now laid out would pass through Eallsaw, Muskogee, Blad Hill, Bixby, Tulsa, Keystone, Yale, Stillwater, Perry, Enid, Cherokee, Alva, and on through southwestern Kansas into Colorado.

**Fort Smith, Ark.**—County Judge Holland plans to build many good roads in Sebastian County.

**Hot Springs, Ark.**—Owing to an error in the paving plans which would jeopardize

the sale of the bonds, new plans must be made at once.

**Phoenix, Ariz.**—Plans approved for the improvement of Lynwood St., from Central Ave. to 3rd Ave., and bids for the improvement of West Monroe St., North 3rd Ave., and Portland Place were referred to the city engineer.

**Phoenix, Ariz.**—City commission discussed paving several streets and avenues.

**Los Angeles, Cal.**—County Road Commissioner was instructed to make survey and furnish estimate for proposed change in Pomona Boulevard near City of Pomona so as to avoid dangerous railroad crossing.

**Los Angeles, Cal.**—Ordinance adopted for the improvement of Hillside Ave. from La Brea Ave. to its terminus east of El Cerrito Place.

**Portersville, Cal.**—Resolution passed by city council for concrete sidewalks throughout the city, \$30,000.

**San Francisco, Cal.**—Pledging itself to the construction of the Parkhill Blvd., to run from 14th and Alpine Sts. to 17th St., over Masonic Ave. and intervening streets, the board of supervisors took the first step in providing a direct link between Market St. and Ashbury Heights. The ultimate cost will total about \$224,000, of which the property owners must pay \$104,000 to obtain rights of way, and the city \$111,000 from the good roads fund for grading and paving.

**San Jose, Cal.**—Board of supervisors decided that the \$1,500,000 county road bonds election would take place during the early part of March. The improvement includes 86 miles of permanent concrete roads to be built and 100½ miles of graded roads with permanent grading and bridge and culvert work,

the plan being to put in the ground work for future paved roads. The program, if carried out, will give this county a system of nearly 500 miles of permanent roads, second to no county in the state.

**South Manchester, Conn.**—For constructing concrete walks and granite curbs, contracts will be awarded about March 1, to cost \$23,000. J. Frank Bowen, City Engr.

**Washington, D. C.**—Citizens urge better roads along the line of the Washington and Old Dominion Railroad in Alexandria and Fairfax counties.

**Jacksonville, Fla.**—See "Sewerage."

**Tarpon, Fla.**—See "Water supply."

**Barnesville, Ga.**—An election will be held Feb. 3 to vote on the question of issuing street improvement bonds for \$15,000.

**Lewiston, Ida.**—State Highway Engineer Booth announces plan for development of the North and South highway. It is proposed to run through Oregon and connect with the Lincoln highway, running to San Francisco, at Winnemucca, Nevada.

**Carmi, Ill.**—To build hard roads, Pike county will vote March 14 on \$252,000 bond issue.

**Decatur, Ill.**—Petition presented to City Council for paving of Franklin St. from Cerro Gordo south to Wood St. with creosoted wooden blocks was referred to the Board of Local Imptas.

**Joliet, Ill.**—Douglass St. from Prairie Ave. to Raynor Ave., is to be paved with asphaltic concrete on a concrete foundation. The estimated cost is \$5,013.80. Public hearing Feb. 5.

**Joliet, Ill.**—Michigan Pl., running from Cass to Benton, is to be paved with brick, with asphalt filling, laid on a con-

crete foundation. McRoberts St. from Cass to Benton, and Webster and Benton Sts., from Michigan Pl. to Eastern Ave., are to be paved with bituminous pavement, laid on a natural foundation. The estimated cost of the improvement is \$21,019.53.

**Kankakee, Ill.**—Ordinances will be presented for action at the council meeting calling for the paving of South Indiana Ave. and the Park subdivision. Estimates are also being prepared for the paving of Rosewood and Wildwood Ave. from Elmer St. to Court St. Address City Engr.

**Lockport, Ill.**—Public improvements committee plans in the spring installation of street curbings on many streets in the city.

**Mount Carroll, Ill.**—Carroll county contemplating issuing \$750,000 bonds for construction of an extensive system of permanent highways.

**Morris, Ill.**—City Attorney W. E. Viner has been instructed to prepare the ordinance for system of walks in East Washington St. the entire distance, to meet the demands for a direct outlet from the industrial section to the court house.

**Naperville, Ill.**—City receiving bids in March for paving streets, West Side; concrete, about \$105,000. C. A. Ashley, City Engr.

**North Chicago, Ill.**—For about \$120,711 Bd. of Local Impts plans paving.

**Onarga, Ill.**—The village is to do considerably more paving the coming year. Total cost of the proposed improvement is estimated at \$41,609.86. Address Town Clerk.

**Rock Island, Ill.**—Board of local improvements take favorable action for the installation of water mains in the new sections at a total cost of \$10,833.10 program and ordinance will be submitted to the city council for approval; 10-inch mains on Ninth St., 31st to 34th Ave.; 6-inch mains on Ninth and a half and 10th Sts., from 31st to 33d Ave.; 6-inch mains on 11th St., from 29th to 39th Ave.; 6-inch mains on 33d and 34th Aves., from 9th to 11th St. Adequate sewer mains will be the next logical step.

**Silvis, Ill.**—Village board decided to pave Second Ave. and the adjacent streets between First and Second Aves., from First to 15th St., with concrete.

**Springfield, Ill.**—Improvement resolutions passed: Brick pavement in 15th St. from Ash to Laurel Sts.; brick pavement in 13th St. from Monroe to South Grand Ave. Contemplates practically one mile of brick pavement. Brick pavement in Haugh St. from 5th to 6th St.; 12-in. vitrified crock pipe sewer to be laid in Matheny Ave. from 17th St. east to East Grand Ave. Ordinances covering the proposed improvements will be prepared and presented to the council shortly.

**Springfield, Ill.**—Resolutions adopted for the paving with brick of Miller St. from 7th to 13th Sts.

**Arlion, Ind.**—Bids received April 5, 1917, at 10 a. m., by treasurer of Noble county, for sale \$10,000 highway improvement bonds, 4½ per cent., ten years. R. C. Riddle, Treasurer.

**Anderson, Ind.**—Bids received Feb. 1, 1917, at 10 a. m., by Treasurer of Madison County, for sale, \$159,820, 12 issues, highway improvement bonds, 4½ per cent., ten years. George T. Beebe, Treasurer.

**Crown Point, Ind.**—Two issues Lake County highway bonds in amounts of \$18,000 and \$20,000 were sold to the Commercial Bank of Crown Point for a total premium of \$1,575.

**Corydon, Ind.**—Bids received Feb. 6, 1917, at 2 p. m., by treasurer of Harrison county, for sale \$2,300 highway improvement bonds, 4 per cent., ten years. T. W. Knight, Treasurer.

**Decatur, Ind.**—Bids received Jan. 29, 1917, at 3 p. m., by treasurer of Adams county, for sale \$11,920, three issues, highway improvement bonds, 4½ per cent., ten years. Geo. E. Kinzie, Treasurer.

**Greenville, Ind.**—Owing to flaw in the specifications prepared for the Greenville road, Floyd County will readvertise.

**Indianapolis, Ind.**—Petition for improvement of E. 21st St. for a distance approximately of three miles in Center and Warren townships will be heard by the board of county commissioners Feb. 7. Cost approximately \$70,000.

**Kokomo, Ind.**—Council voted an appropriation of \$300 for improving sidewalks at intersections.

**Logansport, Ind.**—Two issues Cass county road improvement bonds, \$15,000 and \$8,000. Purchased by J. F. Wild &

Co., of Indianapolis, for premiums of \$571.50 and \$303.10 respectively.

**Portland, Ind.**—Bids received Feb. 1, 1917, at 10 a. m., by treasurer of Jay county, for sale \$18,000 and \$15,200 highway improvement bonds, 4½ per cent., ten years. John W. Current, Treasurer.

**Richmond, Ind.**—County commissioners to advertise for bid on the National highway improvement in Center township known as the Dunbar road. The improvement starts in Centerville and extends 2½ miles west; will be cemented. Centerville will advertise for bids on extra work to be done along with the improvement of the road through the town at the same time.

**Rockville, Ind.**—Bids received Jan. 28, 1917, at 2 p. m., by treasurer of Parke county, for sale \$8,100, \$8,385, \$7,382 and \$2,685 highway improvement bonds, 4 per cent., ten years. E. S. Vickrey, Treasurer.

**Rushville, Ind.**—A \$9,000 issue of Rush county road bonds were sold to the Peoples Loan & Trust Co., of Rushville, Ind., for par, accrued interest and \$168.57 premium.

**South Bend, Ind.**—Board of public works adopted a resolution to widen Leer St. 20 ft. from Lincoln way east to the New York Central railway tracks.

**Vevey, Ind.**—Bids received Feb. 15, 1917, at 1 p. m., by treasurer of Switzerland county, for sale \$6,640 highway improvement bonds, 4½ per cent., 10 years. John W. Smith, Auditor.

**Warsaw, Ind.**—Bids received Feb. 7, 1917, at 1 p. m., by treasurer of Warren county, for sale \$2,500 highway improvement bonds, 4 per cent., ten years. Ernest Grey, Treasurer.

**Sioux City, Ia.**—Commercial Club good road committee decided to recommend that this city be placed on the George Washington National highway, and \$2,000 will be raised for that purpose. Half of the amount will be paid to the national organization, while the remainder will be spent in improving and marking the road in the vicinity of Sioux City.

**Davenport, Ia.**—City council may lay a 12-foot strip of paving on each side of the car tracks on Second St. from Scott to Rock Island or Perry Sts. Commissioner of Public Works John W. Crowley recommended that a special brand of brick be used.

**Des Moines, Ia.**—Council passed resolution for paving of Sixth Ave. and widened to a uniform width of 40 ft. between School St. and Franklin St.; widening the street about 6 ft. for the 12 blocks included.

**Keokuk, Ia.**—The improvements contemplated, which the various committees visiting the council are urging shall be made as early as possible include the paving of Main St. from 14th to the city limits with brick; the paving of Franklin St. from 4th to 13th with brick; the paving of Orleans Ave. from 15th to 16th with cement; the paving of North 14th from Orleans to the avenue with cement and macadam. Paleen St. from 13th to 14th will be covered with cement, as will also Fulton from 15th to 16th. A sewer through Rand park is also contemplated.

**Sheldon, Ia.**—Bids rejected for street pavement to be opened Jan. 15 will re-advertise.

**Sioux City, Ia.**—The board of county supervisors will expend \$10,000 on county roads during the coming year, according to Supervisor Henry Metz. Will authorize the advertising of bids.

**Atchison, Kan.**—City Engineer H. A. Perkins announced that the plans and specifications for the Broadway paving would be filed with City Clerk Fred Metzsch.

**Elk City, Kan.**—Residents requests county commissioners for a couple of county roads out of Elk City.

**Frenchburg, Ky.**—Road bond issue for \$37,000 will be voted March 10.

**Paducah, Ky.**—Plans being prepared by R. H. Young, Court House Bldg., Paducah, Ky., for constructing roads in county for which \$200,000 bonds have been voted. John R. Thompson, County Road Engr.

**Wasloto, Ky.**—Reported city will spend \$30,000 for street improvements this year.

**Jamaica, L. I.**—Grading and regulating proceedings are requested for the sidewalk spaces on Wilson Ave. from Barclay St. to Madison St., Flushing; for a similar improvement in Jamaica Ave. from Lefferts Ave. to Van Wyck Ave., Richmond Hill, and for grading and regulating of the entire street in Cum-

berland St. from New York Ave. to Merrick road, Jamaica.

**Patchogue, L. I.**—Four pieces of concrete road will be laid during the coming spring by Brookhaven town. Highway Supt. Clarence E. Dare will advertise for bids on concrete roads at Ronkonkoma, 2,300 ft.; Mt. Sinai, 1,900 ft.; Bellport, 3,000 ft., and Blue Point, 3,000 feet.

**Brockton, Mass.**—The \$15,000 loan order introduced for permanent road construction in Pleasant St. from Belmont Ave. westerly was referred to the joint standing committee on finance.

**Lawrence, Mass.**—Bridge commission have requested bids for the paving of the Central bridge structure; cost about \$30,000.

**Lunenburg, Mass.**—To complete strip of state road between Lunenburg and Shirley will require \$10,000 more.

**Westfield, Mass.**—Superintendent of Streets C. A. Moore in his report recommends additional work on Union St., the recutting of the granite blocks on School St., improvements in the streets and walks near the new Fort Meadow School and a liberal sum for new walks and repairs.

**Coldwater, Mich.**—An election will be held in the near future to vote on the question of issuing road bonds to the amount of \$600,000.

**Flint, Mich.**—City will vote Jan. 30 a \$405,590 bond issue to cover cost of the proposed work: Pavement, \$56,881; storm water sanitary and intercepting sewers, \$278,559; extension of water mains, \$66,150.

**Flint, Mich.**—The petition for a pavement on Alice St. from Ave. A to Oren Ave. was referred to the street committee.

**Marshall, Mich.**—Bids received Feb. 1, at 4 p. m., for semi-annual road bonds of \$800,000. W. A. Cady, County Clerk.

**Pontiac, Mich.**—The Detroit Trust Co. has accepted the \$250,000 issue of Oakland County road bonds, recently awarded. The Detroit Trust Co. and the Harris Trust & Savings Bank of Detroit will divide the issue, having offered the county a premium of \$9,715.

**Sturgis, Mich.**—City will lay about 50,000 sq. yds. pavement in 1917, mostly concrete, but some brick. They will also lay about a mile of vitrified sewer and construct an addition to the septic tank and filter beds.

**Fergus Falls, Minn.**—Routing of a cross-state highway through central Minnesota, which ultimately will become part of a national highway, and the stimulation of greater interest in improving highways are expected to result from the Central Minnesota Good Roads convention which opened here.

**Minneapolis, Minn.**—The paving of Lyndale Ave. S. was referred to the paving committee.

**Minneapolis, Minn.**—Property owners on Dupont Ave. have petitioned the city council to authorize the paving of Dupont Ave., from 20th to 26th Aves., with concrete. At the next meeting of the council Alderman Hoar will propose the paving under the Elwell law of Fremont Ave., north, from 26th to 42d St., and Emerson Ave. north, from 32d to 38d Sts.

**Winona, Minn.**—See "Sewerage."

**Chillicothe, Mo.**—City will pave with brick block Ann St. from Washington to Cherry St. and Walnut St. from Ann to Jackson. Plans and specifications by City Engineer Broaddus.

**Townsend, Mont.**—Bids received March 6 for \$30,000 road bonds. Wm. S. Rogers, Clerk, Broadwater County.

**Lincoln, Neb.**—Roads committees of the legislature, the highway commission and many members of the legislature discussed plan for a 5,000-mile system of roads in the state built with the \$1,600,000 appropriation from the government. The plan includes a system of north and south, east and west roads in each county, according to State Engineer Johnson, who, speaking for the board, proposed to distribute the appropriation according to the mileage in each county. The roads may be merely dirt roads, surfaced with gravel or clay and in counties where no gravel or clay is available, the government will accept plain dirt roads. The cost will not exceed \$1,000 a mile.

**O'Neill, Neb.**—Holt county will double the size of its bridge and road funds this year, in expectation that the legislature will make a sufficient appropriation for the state and several counties to get in on the federal appropriation for good roads. The bridge fund has been increased to \$30,000 and including the

amounts to be expended by the townships, about \$60,000 will be devoted to road building.

**Superior, Neb.**—Ordinance passed by council authorizing \$9,000 bond issue to pave streets.

**Belvidere, N. J.**—From Belvidere to Washington Warren County plans 8 miles macadam road. A. Vetter, Belvidere County Engr.

**Cape May C. H., N. J.**—For road maintenance during 1917 board of freeholders have appropriated \$50,000. Henry S. Rutherford, Director.

**Freehold, N. J.**—County Engr. Cooper was directed to prepare plans and specifications for regravelling the road from Freehold to Tennent, for a fill at Phalanx and for a new bridge at Belford.

**Garfield, N. J.**—Borough council contemplates the widening and straightening of the River Rd.

**Passaic, N. J.**—County Engr. Garwood Ferguson submitted a list to Passaic County Board of Freeholders of number of roads in all parts of the county which might be improved this year; totaled nearly a million dollars. Nothing definite was decided upon.

**Pennington, N. J.**—Improving several streets contemplated by Borough. Henry L. Lanning, Boro. Clerk.

**Trenton, N. J.**—County Engineer Harry E. Harris at the meeting of the New Jersey State Association of County Engineers at the State House, recommended standard sheet asphalt for permanent road building.

**Trenton, N. J.**—Board of Freeholders approved plans of Freeholder William P. Conard, head of the Department of Road Repair, providing for the application of a tar preparation on numerous roads of the county, and plan for advertising for bids on carting 1,000 tons of stone from the Pennington Trap Rock quarry to points along the Baldwin's Corner-Lawrenceville road. The roads to be resurfaced with tar preparation are Chambers St., White Horse-Bordentown, White Horse-Yardville, Yardville-Crosswicks, Yardville-Windsor and Lawrenceville-Princeton.

**Trenton, N. J.**—City will spend \$104,000 for street paving and \$10,000 for repairs this year. Commissioner will recommend for paving Emory Ave., from Hudson to Chambers; Everett's alley; Elmhurst Ave.; Pennington Ave., between Frazier and Prospect; Anderson St., between Kent and Ashmore; Parkside Ave., north of Stuyvesant; South Clinton Ave., between Remsen St. and the city line; West State St., between Parkside Ave. and Sanhican Drive; Cuyler Ave., between Hamilton and Greenwood; Lafayette St., between South Willow and Warren; Brunswick Ave., between Paul Ave. and the city line; will be recommended for repairs are Elmer, Clinton and Chestnut and North Stockton St., between East State and Commerce Sts.

**Trenton, N. J.**—Freeholder William P. Conard, head of the department of road repair, will offer several resolutions providing for the repairs of numerous roads.

**Binghamton, N. Y.**—City received pavement petitions, cost and yardage, as follows: Floral Ave., from Main St. to the city line, \$8,318; 199, Tompkins St., Conklin Ave., to the bridge, \$12,836; 6,024, Robinson St., Gaylord to Fairview, \$8,678; 5,424, Hawley St., Collier to Exchange, \$3,270; 2,044, Mill St., Conklin Ave., to Newton Ave., \$9,024; 6,640, Park Ave., Vestal Ave., to Ross Park, \$24,320; 15,200, Pearne St., State to Chenango St., \$1,313; 821, Charlotte St., Hamilton St. to Industrial Ave., \$3,760; 2,350, Charlotte St., Jarvis to Hamilton Sts., \$4,480; 2,800, Schubert St., Beethoven St. to Laurel Ave., \$5,712; 3,570, Tayntor Ave., Exchange to Carroll Sts., \$3,064; 1,915, Vestal Ave., DeRussey to Mill Sts., \$10,456; 6,585, Susquehanna St., Carroll to Fayette Sts., \$5,808; 3,630, Tudor St., Susquehanna to South Sts., \$3,040; 1,900, Sanford St., Susquehanna to South Sts., \$2,640; 1,650, Murray St., Main to Leroy Sts., \$6,505; 4,065, Henry St., Fayette to Liberty Sts., \$11,440; 7,150, Chestnut St., Main to Leroy Sts., \$9,184; 5,740, Chestnut St., Leroy St. to Riverside Drive, \$6,512; 4,070, South St., Rockbottom bridge to Varick St., \$1,200; 750, Total estimated cost of city's share, \$140,929; yardage, 88,477.

**Binghamton, N. Y.**—City plans to issue \$25,000 bonds for paving of Robinson St., Henry St., Charlotte St., Floral Ave. and Vestal Ave.

**Brooklyn, N. Y.**—Board of estimate granted final authorizations regulating, grading and paving with asphalt East

22d St. from Duryea Pl. to Beverly road; proposed contract time, 30 days, and estimated cost, \$2,000; 56th St. from 15th Ave. to 16th Ave., contract time 30 days, and cost \$7,500; paving with asphalt DuMont Ave. from Schenck Ave. to Barbe St., contract time, 20 days and estimated cost \$1,900; sewer in 61st St. from 17th Ave. to Eighth Ave., contract time 30 days, estimated cost \$2,400; sewer in East 19th St. from Ave. N to Ave. O, contract time 30 days, estimated cost \$2,400; sewer in East 45th St. from Ave. M to Flatlands Ave., contract time 30 days, estimated cost \$2,600. Only one preliminary authorization, as follows: Grading and curbing Duryea Pl. from Flatbush Ave. to East 22d St., to cost \$400.

**Mt. Vernon, N. Y.**—City engineer's staff are surveying for a new road at the sewage disposal plant in the southeastern part of this city. A road will be graded and paved.

**Oswego, N. Y.**—The proposed Baldwinsville-Plainville County highway plans have been approved by the State Highway Dept. and bids will be asked for construction in the spring; cost, \$122,500. Will be 7.45 miles long. About six-tenths of a mile of the highway in the village of Baldwinsville will be constructed of brick. Four miles will be of concrete and 3 1/2 miles will be of waterbound macadam. This new road will open up a new route from Oswego to Syracuse via Phoenix and Baldwinsville.

**Durham, N. C.**—City planning impts. that are to cost into the hundreds of thousands of dollars placing of all telephone and electric wires of the business district underground; building of new streets in every section of the city; erection of public buildings. Parks will also be established.

**Smithfield, N. C.**—For road bonds to the amount of \$25,000, bids will be received Feb. 5, noon. Clerk County Commissioners, Sam T. Honeycutt.

**Bismarck, N. D.**—City Engineer T. R. Atkinson submitted blue print to city commissioners for the proposed establishment of a road from Rosser St. through the Jackman property, to the Mandan ferry. Cost estimated \$875. No official action taken.

**Akron, O.**—City planning commission suggest that Superior Ave. be extended north from West South St.; also Frances St. easterly to East Ave.

**Bay Village, O.**—Bids received Feb. 15 at noon for road improvement bonds for \$15,000. A. L. Miller, Village Clerk.

**Cleveland, O.**—An ordinance providing for the sale of \$1,000,000 in bonds to pay the city share of the cost of paving, and repaving or resurfacing 255 streets is now pending in the city council. Address City Eng. Hoffman.

**Cincinnati, O.**—County Surveyor Boeh submitted the following estimates to the County Commissioners on the cost of improving Canal road: With macadam \$15,000, with concrete \$35,500; for the improvement through Lockland, macadam \$5,400, concrete \$1,500; improvement of Cliff road, with macadam \$8,000. A request from Mt. Healthy Council to improve Hamilton pike through their village with concrete instead of brick was received; also that the roadway be improved for its full width instead of only 20 feet as specified.

**Cincinnati, O.**—City to improve Free-man Ave., from Fifth St. to north line of Kenner St., by paving with granite.

**Hamilton, O.**—City to proceed with the paving of Main St., Grand Blvd., South Monument Ave., Wilson St., Court St. and Ludlow St., and to resurface High St. It is estimated that the city's portion of this work will cost about \$71,000.

**Hamilton, O.**—Bids for \$15,000 of general street improvement bonds received: Second National Bank, Hamilton, \$501; Hamilton Dime Savings Bank Co., \$460; First National Bank, Hamilton, O., \$500; Citizens Savings Bank & Trust Co., Hamilton, O., \$160.85; Breed, Elliott & Harrison, Cincinnati, O., \$366; Rudolph Kleybolte & Co., Cincinnati, O., \$315; Seasongood & Mayer, Cincinnati, O., \$776; Spitzer, Rorick & Co., Toledo, O., \$570; Tillotson & Walcott Co., Cleveland, O., \$642; First National Bank, Cleveland, O., \$688.60; Sidney Spitzer & Co., Toledo, O., \$661.50; R. L. Dollings Co., Columbus, O., \$753; A. E. Aub & Co., Cincinnati, O., \$680; Provident Savings Bank & Trust Co., Cincinnati, O., \$522; Channer & Sawyer, Cincinnati, O., \$427.50. Street oiling improvement bonds of \$1,128.70. Second National Bank, Hamilton, O., \$7.30; Hamilton Dime Savings Bank Co., Hamilton, O., \$14; Citizens Savings Bank & Trust

Co., Hamilton, O., \$13; Rudolph Kleybolte & Co., Cincinnati, O., par and interest; Seasongood & Mayer, Cincinnati, O., \$9.50; Tillotson & Walcott Co., Cincinnati, O., \$5.64; Sidney Spitzer & Co., Toledo, O., par and interest.

**Hamilton, O.**—The \$15,000 issue of street improvement bonds were sold to Seasongood & Mayer, high bidders, at their bid of \$776 premium. The \$1,128 street oiling issue was sold to the Hamilton Dime Savings Bank at their bid of \$14 premium.

**Hamilton, O.**—City council authorized a \$65,000 bond issue. Paving to be done under this bond issue and plans for which were ordered prepared are High (resurface, Fifth St. to C. and D. railroad), West Main St., South Monument Ave. and the unpaved portions of Wilson, Court and Ludlow Sts.

**Middletown, O.**—City commission will ask \$150,000 bond issue for paving of streets. Third St. from the Miami River to the Big Four railroad, to be paved with wood block or asphalt; First (Crane) St., Clark to Charles, concrete, brick or asphalt; Clinton St., brick or asphalt; Canal St., Third to Fourth, brick or asphalt; Vail St., Clinton to Clark, concrete, also to be sewered; Second St., Charles St., to Sutphin Ave., asphalt or brick; Highland Ave., Superior to Alemeda, concrete; Calumet Ave., Yankee road to Grove Ave., concrete; 10th St., Yankee road to Main St., concrete or asphalt; Superior Ave., Sutphin Ave., to Highland Ave., concrete; Calumet Ave., Curtis to Garfield, concrete; Garfield Ave., Grant St. to corporation, undecided; Baltimore St., Grant to corporation, undecided; Michigan, Garfield to Yankee road, concrete; Sutphin Ave., Stanley Ave. to the corporation, concrete; Alemeda Ave., Lexington to Sutphin Ave., concrete.

**Milan, O.**—County commissioners will pay half the cost of paving Main St. as a part of the highway project for which the state has set aside \$4,000.

**New Berlin, O.**—Village Council is considering the paving of Portage St.

**Portsmouth, O.**—City contemplates improving portion of Vinton Ave. P. G. Harper, City Engr.

**Toledo, O.**—City council approved \$120,000 bond issue for paving streets and alleys for constructing sewers.

**Collinsville, Okla.**—Paving in residential section contemplated by city.

**Miami, Okla.**—Bonds of \$45,000 to improve roads in Quapaw township voted by Ottawa county.

**Okemah, Okla.**—A \$175,000 bond issue will be voted by city for road work, bridges and culverts.

**Hillsboro, Ore.**—Funds for 1917 road work have been apportioned as follows: Beaverton Highway (new), \$10,000; Taylor-Ferry Rd. (Capital highway), \$10,000; Forest Grove-Bank's Rd., \$15,000; Buxton-Forest Grove Rd., \$5,000.

**Portland, Ore.**—Civic league plans for the improvement of Foster road. It is proposed to draft a bill and present it to the legislature enabling the county, city and property owners to improve jointly county roads within the city limits.

**Roseburg, Ore.**—The county court has ordered a new route to be built on the Pacific highway just north of Oakland, for a distance of 3 1/4 miles, leaving Oakland at the steel bridge and following up Cabin Creek to Chenoworth Park.

**Salem, Ore.**—Clackamas county requests the state to provide \$50,000 for highway improvement.

**Butler, Pa.**—Middlesex township supervisors decided to order a special election Feb. 27, when voters will be asked to approve a bond issue to pay the cost of paving Plank road. Like action will probably be taken by Penn township supervisors.

**Harrisburg, Pa.**—The state highway department announced that it had prepared a budget for submission to the general assembly calling for \$24,850,000 for two years, to be used in road improvement.

**Johnstown, Pa.**—A list of the highways that will probably be paved next summer and the following year has been furnished the Sanitary Engineer, and these will be finished first. The thoroughfares include sections of Fairfield Ave., Elbert alley, Stormer alley, Main St., Napoleon St., Sherman St., Washington St., Central Ave., Highland Ave., Hill alley, Mulberry St. and Milford St.

**Middlesex, Pa.**—For paving and sewers in principal streets city will soon vote on \$35,000 bonds.

**Pittsburgh, Pa.**—Ordinance will be in-

roduced to city council for opening 1st Ave. from Ross St. to Try St. and for the grading, paving and curbing of Water St.

**Philadelphia, Pa.**—The State Highway Department will ask the State legislature to appropriate \$21,000,000 for the construction of new roads, repairing and maintenance of old ones and purchasing toll roads during the next two years.

**York, Pa.**—City Engineer Clyde F. W. Wallin in his annual report recommends that the entire paving on North George St. be taken up and relaid, using a 6-in. concrete base.

**Cranston, R. I.**—The city council voted to ask the State of Rhode Island for an appropriation of \$20,000 to continue the work of rebuilding Pontiac Ave., which has been constructed as far as the Pettaconsett bridge.

**Providence, R. I.**—Senator Alberic A. Archambault introduced the act in the General Assembly calling for the appropriation of \$20,000 to be used with a like sum to be apportioned by the town of West Warwick for the purpose of rebuilding Main and Allen streets from the intersection of the Coventry-West Warwick town line at Phenix to the Cowesett road at Crompton; provides for the building of a bituminous sealed road 18 feet wide and approximately two and a half miles long, under the joint supervision of the State Board of Public Roads and the West Warwick Town Council. According to the figures given by Governor Beeckman in his annual message, the cost of building this type of road is \$16,750 per mile, thus making the sum of \$41,875 necessary to carry the project through.

**Irene, S. D.**—Yankton county contemplates \$1,000,000 bond issue for construction of about 140 miles of concrete highways.

**Manchester, Tenn.**—An election will be held March 10 to vote on the question of issuing road and bridge bonds for \$250,000.

**Knoxville, Tenn.**—See "Sewerage."

**Beeville, Tex.**—City is contemplating street paving. E. Williamson, Mayor.

**Beeville, Tex.**—City Engineer Fenner figuring the cost of paving 16 blocks in the business section.

**Buda, Tex.**—To build roads, Road Dist. No. 3 voted \$75,000 bonds.

**Columbus, Tex.**—For highway through Colorado county from the Wharton county line to the Fayette county line, the bond issue of \$100,000 was defeated.

**Dallas, Tex.**—City appropriated \$600 for improving Munger Ave.

**El Paso, Tex.**—The proposed road and bridge improvements to be made in El Paso County will cost approximately \$450,000. It is planned to secure the sum for the improvements by a bond issue which will be called at a later date, when definite estimates are obtained. The various estimates that county Judge E. B. McClintock presented to the commissioners follows: Refacing of El Paso-Ysleta road for 9½ miles, \$175,000. Paving 7½ miles of Socorro-Clint road, \$100,000. Refacing and widening 1½ miles of Ysleta Cross road, \$20,000. Bridge on upper end of Island, \$15,000. Graveling 19 miles of North Loop road, \$47,500. Improvements on roads near Sierra Blanca, \$50,000. Graveling three miles of San Jose road, \$7,500. Graveling two miles of Belen Cross road, \$5,000. Graveling two miles of Clint Cross road, \$5,000. Hueco Tanks road, \$25,000. These do not provide for improvements either on the Alamogordo, borderland route to Deming, N. M., roads in the upper valley across the river, or to the Hill road to Sierra Blanca.

**Glen Rose, Tex.**—Somervell county commissioners have issued \$25,000 in road and bridge warrants for improving the public roads.

**Hillsboro, Tex.**—East Franklin and North Pleasant St. will be improved. F. C. Metzger, City Engr.

**Memphis, Tex.**—An election will be held April 1 to vote on the question of issuing paving bonds for \$30,000.

**San Marcos, Tex.**—Road District No. 3 bonds carried at election for \$75,000.

**Seattle, Wash.**—Bids on Permanent Highway No. 15 will be opened Feb. 26 and involves 1½ miles of one course concrete pavement between Duvall and Noveltiy to cost about \$20,000. The highway will straighten out the old existing road and will connect with the J. D. Merew road running into Tolt.

**Taylor, Tex.**—City contemplates paving streets. W. E. Dozer, city engr.

**Ogden, Utah.**—Resolution was adopted for the creation of a curb and gutter district on 24th St. between Harrison

and Fillmore Aves., the total cost being estimated at \$9,750.

**Ogden, Utah.**—City commissioners plan to pave the roadway of the following streets and avenues with 1½ ins. asphalt wearing surface, 1½ ins. asphalt binder course on 6-in. cement concrete foundation: 27th St. between Jefferson and Madison Ave., 28th St. between Wall and Madison Aves., Adams Ave. between 24th and 28th Sts., and Jefferson Ave. between 27th and 30th Sts.

**Lynchburg, Va.**—Active and organized work has started for improvement of the Link road between Peakland and the Forest road; to raise the \$6,055.45 necessary to secure the improvement with the district aid out of the \$200,000 bond issue.

**Petersburg, Va.**—Common council adopted the \$250,000 bond issue ordinance for public improvements. One of the provisions is for laying sewers and water mains.

**Roanoke, Va.**—Council ordered the construction of a granolithic sidewalk on Nelson St. southeast.

**Roanoke, Va.**—City Engr. Gibbons was instructed to complete the 18-ft. driveway which encircles Highland Pk.

**Keyser, W. Va.**—For road improvement from Ridgeley to Short Gap and then to Alaska county will vote Feb. 10 on a \$140,000 good road bonds.

**Morton, Wash.**—An energetic effort is being made by people of Morton and Riffle to have the National Park Highway extended from here to Riffle, a distance of 8 miles.

**Olympia, Wash.**—Thurston County will receive federal aid in building 3½ miles of permanent roadway between Olympia and Tacoma. The county agrees to appropriate half of the money, or \$28,000.

**Puyallup, Wash.**—The improvement of 3d Ave., S. W., between Pioneer Way and 9th Ave., S. W., and of 2d Ave., N. E., from 3d Ave. to Interurban depot to 13th St., N. E., by graveling, grading, etc., has been petitioned for.

**Rosalia, Wash.**—Residents of Malden are planning a campaign for a good road between that city and Rosalia.

**Seattle, Wash.**—City Council to order the improvement of Jackson St., from the west margin of 21st ave. south to the west margin of 23d Ave. south; paving, constructing armored concrete curbs, sewers, side sewers and water mains. Plans to be prepared by the City Engr.

**Seattle, Wash.**—The report of Engr. J. G. Morgan, of the government national park service on the survey for the Nerada Falls-Cayuse Pass Rd. to Mt. Rainier, has been completed and shows a 29-mile road estimated to cost \$326,000. There will be 18 miles of the road in Lewis county, 10 miles in Pierce county, of which 7 are in the Rainier National Forest, and 20 in Rainier National Park. Several bridges are called for.

**Seattle, Wash.**—City Council plans improvement of 14th Ave. by paving, curbing, sewers and water mains, etc.

**Seattle, Wash.**—City council plans improvements on 40th Ave. paving, concrete curbs, walks, retaining walls, grading, etc. City engineer.

**Seattle, Wash.**—Bids opened by the county commissioners for the purchase of \$500,000 in road bonds resulted as follows, figures premium and interest: Weil, Roth & Co., \$1,500, 4½; Dexter Horton National Bank, \$7,800, 4½; Clark, Kendall & Co., \$8,455, 4½; G. H. Tilden & Co., \$2,867, 4½; Carstens & Earles, \$4,511, 4½; J. E. Price & Co., \$19,470, 4½; and \$3,470, 4½; Eyman & Co., \$8,750, 4½; National City Bank, \$5,332, 4½; Smith & Parshall, \$23,007, 4½; C. H. Rollins & Sons, \$2,375, 4½; State Board of Finance, no premium, 4½; Security Savings Bank & Trust Co., \$3,850, 4½.

**Seattle, Wash.**—Plans have been completed by County Engineer Sam Humes for the construction of two highways which will aggregate a cost of between \$100,000 and \$150,000. The largest improvement calls for a concrete or brick paved road between the Duwamish River and Renton Junction to cost between \$75,000 and \$125,000 known as Permanent Highway No. 3-A. Eight alternative propositions will be bid upon, including brick block, brick monolithic, brick on various depths of concrete base, and one course concrete; road will be 20 ft. wide and is a continuation of the Sparger Concrete Co. job at the end of East Marginal Way. The road under the latest contract calls for 3½ miles of paving.

**Spokane, Wash.**—County commission-

ers petitioned for a paved highway from Fairfield south to the Whitman county line, a distance of 10 miles and approximating a cost of \$50,000 to \$60,000.

**Spokane, Wash.**—Bids for the grading, curbing and sidewalk of Nevada St. from Rowan to Euclid, and of Euclid Ave., from Nevada to Hamilton, will be called.

**Barron, Wis.**—For about \$38,878 Barron County plans road work. County Clerk, Barron.

**Fond du Lac, Wis.**—City commission planned for the paving of the Taychedah road this year with concrete 3½ ins. in thickness at the edges of the pavement and 5 ins. in thickness at the center. The concrete will be covered with an inch and a half granite wearing surface. The width of the pavement will be determined later.

**Superior, Wis.**—Supervisor A. G. Earnshaw announced Lake Nebogamon plans construction of a lake shore drive to be in the nature of a boulevard.

**Superior, Wis.**—Streets will be improved at South and East ends and Normal district. The paving of Central Ave. from Hughtt Ave. to the Northern Pacific Railway's tracks; 59th St. from John to the N. P. tracks and West Sixth St. from Cadott Ave. to the court house. Commissioner F. C. Tomlinson, head of the street department.

**Sandwich, Ont.**—Plans and estimates are being prepared for cement and concrete pavement and walks to be laid on Askin Blvd. Engineer, C. R. McCall, 125 Assumption St., Windsor, Ont.

#### BIDS RECEIVED AND CONTRACTS AWARDED.

(\*Indicates contracts awarded.)

**Moulton, Ala.**—For constructing five miles macadam road to \*Will Huskey, Courtland, Ala.

**Berkeley, Cal.**—\*Union Investment Company, the northern half of Snyder Ave. from a line parallel to the Western line of 7th St.; 101 feet Westerly therefrom, westerly 139 feet, to be graded. A concrete curb with a combined 3-foot gutter be constructed along the curb line adjacent to the roadway macadamized and surfaced with oil and rock screenings.

**Los Angeles, Cal.**—For improvement work on Temple Avenue, Signal Hill, Catalina Ave. and Panorama Drive to \*Crown Contracting Co.

**Los Angeles, Cal.**—For improvement work of Road District Improvement No. 120 (Florence Ave.), to \*M. E. Shafter.

**Los Angeles, Cal.**—For improvement work of Road District Improvement No. 90 (Azusa Ave.), \*E. A. Baker.

**Modesto, Cal.**—Board of supervisors of Stanislaus county for paved highway with cement concrete, 13.8 miles, 16 ft. road, 4 ins. thick, including 34,000 cu. yds. earth excavation, Central California Paving Co., Modesto, 4 miles, \$41,720; excavation, cu. yds., 30 cts, total \$46,000; Gaskill & Foley, Stockton, 6.4 miles, \$50,529; excavation, cu. yd., .0493, total \$56,000; Western Construction Co., Oakland, 4.42 miles, \$39,790; excavation, cu. yds. 0.39, total, \$44,000, E. H. Anearns.

**Placerville, Cal.**—The supervisors for the Morgan grade to \*Scott & Turner, \$18,685.48.

**Jordan, Ill.**—\*J. B. Drew, Sterling, secured contract let by city for gravel roads and culverts, \$19,996.

**Salem, Ind.**—The \*Boone Construction Co. was the successful bidder for contract for Marion county highway in Center and Perry Twps.; bid of \$2,538.

**Algona, Ia.**—The city council has let the contract for four miles of additional paving, the work to start soon. Specifications call for asphaltic concrete type of paving and the low bid which was accepted was for \$1.53 per yard. Before the paving starts about \$30,000 worth of sewer work and extension of mains will be done.

**Grundy Center, Ia.**—The \*Ford Paving Co. of Cedar Rapids have received a contract to construct 42 blocks of bituminous pavement, price \$100,000.

**Independence, Ia.**—Paving contract of \$99,500 \*Reinking Contracting Co., of Des Moines, by city council for the paving of 53 blocks in the business and residence districts; \$1.51 a yard for paving and 52 cents for curbing.

**Baltimore, Md.**—\*Consolidated Engineering Co., 242 Calvert Bldg., were the lowest bidders for the three sections of Key highway, opened by the board of awards, price \$164,000. Bids were asked on three separate items—grading, paving and the building of a bridge over the

highway at Fort Ave. For the bridge the Lawson Construction Co. bid \$21,474. On grading, \*Fisher & Caroza, 305 E. Preston St., \$39,150.

**Baltimore, Md.**—\*Consolidated Engineering Co., 242 Calvert Bldg., Baltimore, Md., for street paving.

**Van Buren, Md.**—Hutton-Jarris Construction Co., North Vernon, Ind., at \$35,618, for constructing A. A. Orn road.

**Duluth, Minn.**—Rogers & McLean submitted the lowest proposal on paving Second Ave. east, from Second to Seventh St., with sandstone blocks and a sandstone curb. Next council meeting Commissioner Farrell will introduce a resolution awarding the contract on their bid of \$24,395.50. Bids submitted follow: E. A. Dahl & Co., \$26,104.21; Olson & Johnson, \$27,718.20; D. H. Clough & Co., \$24,548.55; August Bodin & Son, \$26,677.75; Magnus Peterson, Superior, Wis., \$26,747.50; Johannes Johnson, \$26,304.95; A. N. Nelson, \$26,674.15.

**Emile, Neb.**—\*Kible Construction Co., for grading 40th and B Sts.; Curley Lane to \*R. Condon, by council.

**Freehold, N. J.**—Board of freeholders to \*Hafeman & Co., of Freehold, for paving a half-mile section of Brighton Ave., Long Branch, for \$16,651.50, and a two-mile stretch of the Keyport-Red Bank road for \$72,622.68. Both thoroughfares are to be paved with amesite with a concrete base.

**Amsterdam, N. Y.**—For street paving, asphalt block, 34,500 sq. yds., concrete foundation, 6-in. thick, excavation material, rock and old macadam. Bidders: Jos. Dimando, 332 Mamaroneck Ave., Mamaroneck, N. Y.; paving, per sq. yd., \$2.94; excavations included; total, \$110,180. John P. Dugar Co., Amsterdam, N. Y., paving, per sq. yd., \$3.06; excavations included; total, \$111,820. Troy Paving Co., Troy, N. Y., \$123,065. Frank Stento, 129 Susquehanna St., Binghamton, \$119,830.

**Buffalo, N. Y.**—\*F. Taylor, about \$7,125, secured contract let by city commission paving portion Keneffick Ave.

**Cincinnati, O.**—\*Wesley & Taulman, Hazelwood, O., Clark and Given road, 2,934 sq. yds., macadam, 94 lin. ft., corrugated drain, 12-in. pipe, \$2,813. Engr., W. H. Boeh, Court House, Fred E. Weissman, Pres. Bd. of Comrs. of Hamilton County, Albert Reinhardt, Clk.

**Warren, O.**—John J. C. Walters, Hubert, O., for McDonald road, Weathersfield township, .92 mile, waterbound slag roadway, \$16,590. Engr., R. E. Hampel, Court House, W. R. Harrington, Clk., Trumbull County, Court House.

**Pittsburgh, Pa.**—Booth & Flinn, 1942 Forbes St., by city, for improving Forest Way and 33d St., \$9,365 and \$5,738.

**Wilkes-Barre, Pa.**—\*Warner-Quinlan Co., 42 Broadway, for paving numerous city streets with asphalt, being the only company that submitted a bid with a 10-year guarantee. The company bid \$2.19 per sq. yd. on the paving and its contract is worth \$128,912, of which \$30,000 is for curbing. The State Paving Co., 243 Carey Ave., and the Central Construction & Supply Co., submitted bids on a 5-year contract. The Central Construction Co. bid \$2 per sq. yd. with 5-year guarantee, and the State Paving Co. bid \$2.37 per sq. yd. For the paving of the following streets with asphalt: Madison St., between Market and Coal; Sherman, between Market and Coal; Fulton, between Market and Puritan lane; Meade, between Market and Coal; Ruddle, between Hazel and the Lehigh Coal & Navigation property; Waller, between Horton and Division; Franklin, between Kulp and Elm; Lawrence, between Carey Ave. and Plymouth Ave.; Onk, between Carey and Plymouth Aves.; Willow, between Carey Ave. and Plymouth Ave.; Simpson St., between Carey and Plymouth Aves.; Carlisle, between Carey Ave. and Horton St.; Alexander, between Carey Ave. and Elizabeth; Sturdevant, between Carey Ave. and Carlisle; Stark St., between Carey Ave. and Carlisle; Beech, between McLean and Poplar; Brook, between Barney and Waller. Bids were received for the paving of several streets with brick and block. Council did not award this contract. John A. James, 45 S. Grant St.; B. G. Coon, the State Paving Co., 243 Carey Ave.; the Banks Construction Co., P. P. Boyle, and the Warner-Quinlan Co., 42 Broadway, bid on the brick work. Various brick were specified and bids were submitted on all of them. The bid of John A. James on the different kind of brick was: Bessemer, \$2.54; Keystone, \$2.35; Mayer, \$2.54; Penn Clay, \$2.60. The B. G. Coon bid was: Keystone, \$2.43; Toronto, \$2.55; Mack, \$2.55. The State Pav-

ing Co. are: Bessemer, \$2.71; Keystone, \$2.61; Toronto, \$2.79; Mack, \$2.77. Banks Construction Co.: Bessemer, \$2.45; Keystone, \$2.37; Toronto, \$2.45; Mack, \$2.38; Mayer, \$2.36; Penn Clay, \$2.44; Clysdale, \$2.36. The P. J. Boyle bid was: Bessemer, \$2.49; Keystone, \$2.36; Toronto, \$2.49; Mack, \$2.52; Mayer, \$2.48; Penn Clay, \$2.48; Clysdale, \$2.48; Porter, \$2.48. The Warner-Quinlan bid was: Bessemer, \$2.50; Keystone, \$2.45; Mack, \$2.47. Bids on curbing were: John A. James for Medina, 90 cts. per ft.; for extra size, \$1.04; B. G. Coon for Medina, 95 cts.; extra size, \$1.15; H. H. B. S., 90 cts.; Wainright, 80 cts.; State Paving Co. for Medina, 95 cts.; extra size, \$1.05; Bank & Co., for Medina, 94 cts.; extra size, \$1.05; H. H. B. S., 93 cts.; Wainright, 78 cts.; P. J. Boyle for Medina, 98 cts.; extra size, 99 cts.; H. H. B. S., 88 cts.; Wainright, 80 cts.; Warner-Quinlan for Medina, 94 cts.; extra size, \$1.09; H. H. B. S., 94 cts.; Wainright, 90 cts.

**Fort Worth, Tex.**—For the paving of Tucker St. from South Main St. to Jennings Ave. and of Missouri Ave. from Magnolia Ave. to Maddox Ave., by the city commission to the \*General Construction Co. Will be paved with asphaltic macadam at \$1.25 a sq. yd. The commission authorized the signing of contracts with the \*Texas Bitulithic Co. for the paving of May St. from Capps St. to Bernard St. and Bernard St. from May St. to Jennings Ave.

**Glen Rose, Tex.**—Somerville county commissioners awarded to \*N. A. Dawson of San Antonio for grading and graveling about 40 miles of highway, touching the county line in five directions from Glen Rose.

**Hallettsville, Tex.**—For constructing 10 miles of gravel road to \*J. A. Coopwood, Shiner, Tex., at \$50,500.

**Roanoke, Va.**—For the construction of a granolithic sidewalk on Rorer Ave., between 18th and 20th Sts., to \*Tinsley Constr. Co.

**Roanoke, Va.**—For a granolithic sidewalk on 12th St., between Gilmer and Melrose Aves., \*J. I. Crosby.

**South Bend, Wash.**—For the construction of the Nasel-Knapton road resulted as follows: Kolback, Wirkkala, Clemi Co., Nasal, Wash., \$14,792.87; F. O. Pentia, Nasal, Wash., \$19,030.20; M. P. Zindorf, Sea View, Wash., \$14,912.90; Keating & Jamison, Portland, \$15,601.54; A. J. Scott, Astoria, Ore., \$14,755.46.

**Tacoma, Wash.**—Pierce county commissioners for the construction of a trestle roadway on 11th St., to \*J. A. McEachern Co., Bell St. Dock, Seattle, at \$20,000.

## SEWERAGE

**Earle, Ark.**—City contemplates sewer system. H. C. Crum, city recorder.

**Alhambra, Cal.**—City considering sewer system. C. E. Hewes, city engr.

**Jacksonville, Fla.**—Bond trustees decided to sell bonds amounting to \$250,000 Feb. 20, to be used for sewers, drains and street paving.

**Tarpon Springs, Fla.**—See "Water Supply."

**Nezperce, Id.**—Ordinance providing for the construction of a sanitary sewer system to serve entire incorporated area of Nezperce, passed by council. Sawyer Bros., engineers, Spokane, have prepared preliminary surveys and estimates.

**Alton, Ill.**—Members of the board of local improvements and the city engineer have under consideration a new plan for extending the Plaza trunk sewer. Address City Counselor W. P. Boynton.

**Danville, Ill.**—For 3 brick sewers, city to let contract in the spring, about \$17,000. W. H. Martin, city engr.

**Decatur, Ill.**—Intercepting sewer to cost the city \$320,000. Engineers Pearse & Greeley submitted to the city council estimates of \$75,000 more for a sewerage system to relieve Riverside and protect the water supply.

**Rock Island, Ill.**—See "Streets and Roads."

**Springfield, Ill.**—See "Streets and Roads."

**Ankeny, Ia.**—City has voted \$6,500 for sewer system and \$6,500 for water works extensions. Lawrence W. Cox, Engr., 1316 E. 12th St., Des Moines.

**Anton, Ia.**—For about \$10,500, city plans for improving sewers.

**Iowa Falls, Ia.**—City plans extending sewer system.

**Keokuk, Ia.**—See "Streets and Roads." **North McGregor, Ia.**—See "Water Supply."

**Emporia, Kan.**—City commission received and filed a petition for extension of the sewer mains on the west side.

**Jamaica, L. I.**—A sewer is asked in Oxford Ave. from a point 30 ft. south of Ashland St. to Ashland St. and in Ashland St. from Oxford Ave. to Freedom Ave., Fourth Ward.

**Jamaica, L. I.**—The following final authorizations were granted for sewers for Queens: Beaufort Ave., Richmond Hill, from Guion Ave. to Seattle St.; Portland Ave. from Beaufort to the crown northwardly therefrom; Herald Ave. from Beaufort to Chichester and Guion from Beaufort to Chichester; contract time 50 days, cost \$8,400; also in Filmore Ave., Corona, from 46th St. to Junction Ave.; contract time 40 days, cost \$4,700; in 46th St. from Polk Ave. to Hayes Ave.; also in 45th, 44th, 43d, 42d, 41st, 40th Sts. and Junction Ave. between Polk and Hayes Aves.; contract time 200 days, cost \$44,300; also at Woodhaven in Atlantic Ave. from Vanderveer Ave. to Freedom Ave., and in Hatch Ave. from the north side of Atlantic Ave. to Fulton Ave., contract time 60 days, cost \$8,500. These are a part of the big Corona sewer system, comprising between 6,000 and 7,000 acres, and extending from North Beach on the north to Forest Hills and Middle Village. The following preliminary authorizations: In 15th St., Corona, from Hayes Ave. to the crown about 460 ft. north of Jackson Ave.; in 45th, 46th, 47th, 48th and 49th Sts. from Hayes Ave. to Burnside Ave.; in 44th St. from Hayes Ave. to the crown about 180 ft. south of Burnside Ave.; in 43d St. from Hayes Ave. to a crown about 250 ft. north of Jackson Ave.; in 42d St. from Hayes Ave. to Jackson Ave.; in 41st St. from Hayes Ave. to a crown about 200 ft. northerly therefrom, and in Jackson Ave., both sides, from 43d St. to 53d St., to cost \$57,100. Sewer in Hancock St., Ridgewood, from Wyckoff St. to the Evergreen branch of the Long Island Railroad, to cost \$500. Sewer in Emerson St., Richmond Hill, from Freedom Ave. to Oxford St., to cost \$2,200.

**Detroit, Mich.**—City's most comprehensive sewer program must be drawn in the shortest time ever given for preparation of a municipal budget, according to Clarence W. Hubbell, new city engineer, who has his staff working at maximum speed to get the estimates ready by Feb. 1.

**Flint, Mich.**—See "Streets & Roads."

**Flint, Mich.**—The petition for a sewer on Bishop Ave., from North Saginaw St. to Oxford St., was referred to the sewer committee.

**Sturgis, Mich.**—See "Streets and Rds."

**Chattfield, Minn.**—For extending sewer, city will receive bids in April. F. H. Bass, 244 Plymouth Building, Minneapolis, engr.

**Winona, Minn.**—City Council will request legislature for authorization to issue bonds up to \$150,000 to cover a four-year period to carry on sewerage and paving work in new districts and at the same time provide for repairs in sewers where they are needed.

**St. Louis, Mo.**—Board of public service approved a plan solving the River des Peres problem by converting the winding stream into the biggest sewer in the world. Sewer will be 13 miles long, and will cut more than 3 miles from the stream's length in straightening it out and "harnessing" it. Its present length from the city limits near Delmar Station to the Mississippi River is 16.7 miles, according to W. W. Horner, advising engineer of the sewer division, who designed the big tubes. The plan adopted will not be put into effect until the necessary funds are available. The total cost of the project is estimated at \$6,660,900 by the board. This includes about \$1,000,000 for removing and changing bridges, acquiring portions of the right of way, making sewer extensions and connections and completing the present sanitary sewer beneath the storm water tubes. The plan calls for a single barrel tube 32 ft. wide and 25 ft. high from the city limits to the Union Ave. entrance to Forest Park. The section through Forest Park to Macklind Ave. contains two tubes, each 29 ft. wide and 24 ft. high. The section from Macklind Ave. to the Mississippi River will be an open concrete channel ranging from 90 ft. wide at the top to 200 ft. wide as it nears the river.

**Schenectady, N. Y.**—Supt. of Public Works E. O. Hunt, in his annual report,

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recommends purchase of a sewer-cleaning machine to obviate the need of cutting pavements to relieve clogged pipes.

**Canton, O.**—An ordinance passed to issue \$17,000 in bonds for the construction of the central southwest storm sewers.

**Cincinnati, O.**—For constructing sewage disposal plant city voted bond issue.

**Hamilton, O.**—City Engineer Frank Weaver will prepare plans for a sanitary sewer on Shuler Ave. between Edison and Hancock Aves., and on Hancock Ave. between Howell and Hancock Aves.

**Toledo, O.**—See "Streets and Roads."

**Altoona, Pa.**—City plans to spend \$285,000 for sanitary sewers. J. W. Shields, city engr.

**Hazleton, Pa.**—The city commissioners are considering the advisability of employing an expert consulting engineer on the question of sewage disposal plants, to aid in the preparation of the plans of the proposed disposal plant for this city. The plans for the comprehensive sewer system as demanded by the State Dept. of Health have been prepared and were mailed to Dr. Dixon at Harrisburg. The State Dept. is also forcing cities to erect disposal plants. In cases where orders have not been given to erect plants, instructions for plans to be prepared have been issued.

**Johnstown, Pa.**—Plans of the treatment plant and the main sewers demanded by the State Health Department are finished and sent to Harrisburg for approval, Sanitary Engineer C. P. Collins and his staff have started on the preparation of detail plans on approximately 75 miles of lateral sewers throughout the city. The laterals on streets that are to be paved next summer are being drawn first.

**Lansdale, Pa.**—As ordered by state authorities Borough plans installation of sewer system to cost \$225,000.

**Rocky River, O.**—To install sewers, disposal plant, tunnels, etc., city receiving bids Feb. 12 for \$50,000. F. Mitchell, clerk.

**Bishopville, S. C.**—See "Water Supply."

**Chesterfield, S. C.**—See "Water Supply."

**Jackson, Tenn.**—For extension of sewer system, city will call an election to vote \$30,000 or \$40,000 bonds.

**Knoxville, Tenn.**—Legislature will be asked to pass bill authorizing the city to issue \$600,000 bonds to be used for extending mains, sewers, street improvements and erecting schools.

**Athens, Tex.**—A. B. Axtell to prepare plans for sewer system and sewerage treatment plant for city.

**Bryan, Tex.**—Bids received Feb. 1 for sewer improvement bonds of \$8,000. R. T. Smith, City Secy.

**Lagrange, Tex.**—For about \$5,000 to \$7,000 city plans a disposal plant. C. E. Hackebell, mayor.

**Paris, Tex.**—A bond issue of \$10,000 voted by city for sewer construction.

**San Antonio, Tex.**—Motion of Commissioner Kearny, authority was granted the federal government to construct a sewer from Fort Sam Houston to a connection with the city sewer on Appler St., the work to be done under the supervision of the city engineer.

**Waxahachie, Tex.**—Mayor E. B. Prince has been authorized by the city council to secure plans for the construction of a sewer disposal plant for the city of Waxahachie, bonds having been voted some months ago providing \$20,000 with which to erect the plant.

**Murray, Utah.**—City will publish a notice of intention to commence work on the new proposed sewer system to run through 600 feet of Vine St., also through Wasatch, Bamberger and Hanover Avenues.

**Ogden, Utah.**—Resolution adopted, Engineer Tracy for the creation of a sewer district on Jefferson Ave. between 28th and 29th Sts., at an estimated total cost of \$1,800. The proposal is to use vitrified or concrete pipe of sufficient capacity and to connect with the manholes of the present sewer system.

**Petersburg, Va.**—See "Sewerage."

**Seattle, Wash.**—Plans have been completed by Sawyer Bros. Henry Bldg., this city and Spokane, for the construction of a \$35,000 sewer system for Nezperce, Idaho.

**Beloit, Wis.**—City engineer is preparing estimates for additional sewers. Address City Engr. Heeburk.

**Burlington, Wis.**—Survey and plans for draining the lands in the Eagle Creek drainage district, in Racine Co., Wis., have been submitted. Work contemplated will probably be appointed soon. The work consists of the construction of a

main ditch and four laterals. Two plans have been submitted. Work contemplated under plan 1: 171,766 cu. yds. excavation, 1,500 lin. ft. 20-in. tile, 3,300 lin. ft. 16-in. tile, 1,500 lin. ft. 18-in. tile, 4,200 lin. ft. 15-in. tile, 1,400 lin. ft. 14-in. tile, 5,098 lin. ft. 12-in. tile; estimated cost, \$29,060. Under plan 2: 112,620 cu. yds. excavation, 1,500 lin. ft. 30-in. tile, 4,100 lin. ft. 27-in. tile, 4,300 lin. ft. 24-in. tile, 4,300 lin. ft. 22-in. tile, 1,500 lin. ft. 20-in. tile, 1,500 lin. ft. 18-in. tile, 3,300 lin. ft. 16-in. tile, 4,200 lin. ft. 15-in. tile, 1,400 lin. ft. 14-in. tile, 5,098 lin. ft. 12-in. tile; estimated cost, \$37,520. Engineer, P. J. Hertgen.

**Wis. Arcadia.**—Sewerage system plans laid out until 1918.

**Manston, Wis.**—Engr. W. G. Kirchoff Madison; H. J. Gibson, City Clerk. About 5 blocks of 24-in. vit. or concr. sewer pipe, 12 ft. deep, to be let; also concrete reservoir, piping, foundation for water works.

**Milwaukee, Wis.**—Later in February bids will be asked for the construction of a 30-inch intercepting sewer from Clinton and Beecher Sts. to 1st and Cleveland Aves. Address F. C. Hatton, Chief Eng. of Sewerage Commission.

**New Lisbon, Wis.**—Sewage disposal tank to be installed here; bids to be asked in the spring; H. J. Gibson, city clerk.

**Oconomowoc, Wis.**—For storm sewer in Forest St., 2,300 ft. 24-in. pipe, City Engineer J. Alex. Stempel is preparing plans.

**Union Grove, Wis.**—For sewage system and disposal tank, Engineer W. G. Kirchoff, Madison, is preparing plans; cost \$15,000.

**Wis. Chilton.**—Following sewers ordered laid by city council: Dist. No. 1, 275 ft. 8-in. pipe; 445 ft. 10-in. pipe, 580 ft. 12-in. pipe in Main St.; 1,635 ft. 12-in. pipe; 75 ft. 8-in. pipe in N Madison St.; 1,240 ft. 8-in. pipe in Washington St.; 1,410 ft. 8-in. pipe, 800 ft. 10-in. pipe in State St.; 840 ft. 8-in. pipe in Court St.; 720 ft. 8-in. pipe in Jefferson St.; 1,135 ft. 8-in. pipe in Reed St.; 660 ft. 8-in. pipe in Lincoln St.; 660 ft. 8-in. pipe in Baldwin St.; 560 ft. 15-in. pipe, 730 ft. 12-in. pipe, 530 ft. 10-in. pipe, 1,150 ft. 8-in. pipe in Grand St.; 1,030 ft. 8-in. pipe in Lehner St.; 300 ft. 10-in. pipe in W. Water St.; 930 ft. 8-in. pipe, 775 ft. 10-in. pipe in Spring St.; Dist. No. 2, 800 ft. 15-in. pipe, 1,750 ft. 12-in. pipe in Main St.; 410 ft. 12-in. pipe, 1,795 ft. 8-in. pipe in Park St.; 1,250 ft. 15-in. pipe in Grand St.; 1,240 ft. 8-in. pipe in Pennsylvania St.; 1,140 ft. 8-in. pipe in Pennsylvania St.; 1,105 ft. 10-in. pipe in Columbia St.; 6,600 ft. 8-in. pipe in Commerce St.; 430 ft. 8-in. pipe in Mill St.; 870 ft. 8-in. pipe in Brooklyn St.; 865 ft. 8-in. pipe in Oak St.; 1,735 ft. 8-in. pipe in Chestnut St.; 590 ft. 8-in. pipe in Maple St.; 880 ft. 8-in. pipe in S. State St.; 900 ft. 8-in. pipe in Marigold St.; 300 ft. 8-in. pipe in Brooklyn Heights; 1,240 ft. 10-in. pipe in Madison St. Plans on file with A. J. Pfeffer, city clerk.

**London, Ont.**—Plans for the construction of a storm sewer in West London are now in the hands of city engineer H. A. Brazier.

**Sandwich, Ont.**—Plans are being prepared for sewer and water mains of vitrified salt-glazed construction. Engineer, C. R. McColl, 125 Assumption St., Windsor, Ont.

**Dartmouth, N. S.**—A by-law has been passed for water and sewerage extensions on Stair St. and Victoria Rd. Estimated cost, \$5,000. Alfred Elliot, Clerk.

#### BIDS RECEIVED AND CONTRACTS AWARDED.

(\*Indicates contracts awarded.)

**Los Angeles, Cal.**—Board of Public Works to \*Andrew Jayich, at \$294,90, for a vitrified pipe sanitary sewer in Gaffey St., from the center line of Third St. to a point 111.96 ft. northerly from the center line of Fourth St.

**Indianapolis, Ind.**—Board of Public Works let the following contract: Local sewer in first alley east of Shelby St., from Calhoun St. to LaGrande Ave., to \*Eastern Construction Co.

**Burlington, Ia.**—\*Burlington Construction Co., Burlington, and Schmidt Olson Co., St. Joseph. West Hill sewer, at \$25,000. Engr. C. E. Waterhouse; James M. Bell, Mayor.

**Farmington, Minn.**—\*Dearborn Construction Co., Waterloo, Ia., sewer and water system, about \$22,000 ft. 8 to 15-in. vit. tile sewer. Engr. J. F. Druar, 312 Commercial Bldg., St. Paul; L. A. Whitier, Village Clk.

**St. Paul, Minn.**—For the construction of a sewer on Hythe St. between Doswell and Dudley Aves. to \*Thornton Bros. Co., 401 Scan. Am. Bank Bldg., at \$3,117. Engineer's estimate \$3,130.

**St. Paul, Minn.**—For the construction of a sewer on Marshall Ave. from Snelling Ave. to a point 600 ft. east of the east line of Asbury Ave., to \*J. J. Connolly, at bid of \$2,384. Engineer's estimate, \$2,243.

**St. Paul, Minn.**—For the construction of a sewer on St. Clair St. between Cleveland Ave. and Josephine St., to \*O'Neill & Preston at bid of \$4,000. Engineer's estimate being \$4,498.

**Kansas City, Mo.**—For sewer in Dist. No. 38, Div. No. 4, \*Halpin Boyle Construction Co., 709 Railway Exchange Building, submitted low bid, \$15,000.

**Syracuse, N. Y.**—Antonio Sposato was low bidder Board of Contract and Supply for constructing a 21-inch p.p. sewer in Glenwood Ave. from the Elmwood trunk sewer to Elmwood Ave. and in Elmwood Ave. from Glenwood Ave. to Greenwood Ave., figure \$3,700.20. One other bid, the Monroe Construction Co., \$3,910.70.

**Tonkers, N. Y.**—Board of contract and supply for the construction of a house and storm water sewer in Silk place, Iseann St. and Montague St., \*Fred E. Gross, bid of \$10,400. Other bidders, F. A. Cianfragone, \$13,500; Nicholas Mangini, 17 Cliff Ave., \$12,950; J. J. Corbans, 811 Clover St., \$14,150; Molloy and Murray, \$14,900; O'Rourke Contracting Co., 12 N. Broadway, \$11,550; Joseph L. Cuzzo, \$12,318.99; Joseph De Marco, \$12,597; Thomas F. Grady, 11 Myrtle St., \$12,000.

**Fargo, N. D.**—\*Ed Madison for making the sewer and water curb connections for the city on streets on which paving is contemplated.

**Columbus, O.**—\*Amen Bros., E. Lane Ave., 320 lin. ft. 8-in. sewer pipe, 5 brick manholes, alley north of Longeder Ave. and alley north of Como Ave., \$1,147. Engr., Henry Meatzel, City Hall; Geo. A. Borden, Dir. Pub. Service; Paul B. Kemper City Clk., City Hall.

**Sidney, O.**—\*A. J. Yarbe, Jr., sanitary sewer various streets. Engr., Thalene Blake, N. Main St.; C. Dailey Weese, Dir. Pub. Service.

**Plains, Pa.**—For sewer, 325 lin. ft. 18-in. terra cotta pipe sewer in Stenton St. to \*Jos. Moritz Co., School St., Hudson, Pa., at \$1,936; 600 lin. ft. 24-in. and 250 lin. ft. 12-in. pipe, 7 catch basins, 3 manholes in Bailey St. to \*Moses Griffith, Moffett St., at \$2,000. J. A. Devlin, Secy., Village Council.

**Roanoke, Va.**—For the construction of a sanitary sewer to serve property on Mercer, Staunton and Hanover Aves., between 19th and 20th sts. n. w., to \*E. R. Magee.

**Huntington, W. Va.**—\*Steuder Construction Co., 302 6th St. lateral sewer, Hagan St. to Third St., 445 ft. 9-in. tile. Engr., A. E. Maupin; O. H. Wells, Comr. of Sts.

**Marshfield, Wis.**—For sewerage disposal plant \*Circular Concrete Co., 100 Corn Exchange Bldg., Minneapolis, Minn. John Sewbert, City Clerk, City Hall, Marshfield; J. F. Druar, Engr., 312 Commercial Bldg., St. Paul, Minn.

**Waukesha, Wis.**—\*John McGovern, \$3,594, construction of storm sewer from Fox river along State, Hamilton, Franklin and Elizabeth Sts. Other bidders: F. P. Cayll, \$3,764; C. A. Dailey & Son, \$4,380; K. Koontz, Chicago, \$4,195.

#### WATER SUPPLY

**Brawley, Cal.**—City council has authorized the issuance of water system improvement bonds for \$17,000.

**Grass Valley, Cal.**—An election may be called to issue \$40,000 bonds for water works improvements.

**Paco Robles, Cal.**—Water bonds to the amount of \$75,000 carried at recent election.

**Washington, D. C.**—Bureau of Foreign and Domestic Commerce (Department of Commerce).—A firm in Norway desires to receive bids on c. i. or steel pipes for a new municipal waterworks. The pipes are to be 17.7165 inches in diameter and made after the German Mannesmann method. About 22.37 miles of this piping will be required. Delivery will not be required before the latter part of 1917. Quotations should be made c. i. f. Cash will be paid. Correspondence may be in English. Reference. Refer to Opportunity No. 23527.

**Tarpon Springs, Fla.**—Election on the proposition of issuing bonds for \$37,600 for waterworks improvements, opening

new streets and putting in new sewers will be held Jan. 22.

**Atlanta, Ga.**—General Manager W. Z. Smith of the water department in his annual report recommends the installation of a new pumping engine.

**Hamilton, Ga.**—The city of Hamilton contemplates constructing water works and it is desired to hear from parties that engage in that kind of work, J. H. Lynch, Mayor.

**Pocatello, Id.**—City council received bids for the \$150,000 of water works bonds, which were voted at the special election last fall. The bids were turned over to the water committee and special counsel for tabulation. The following is the list of bidders, their residence, rate of interest and premiums offered: Seasongood & Mayer and Fifth Third National Bank, Cincinnati, rate of interest 4% and 5 per cent., premium \$1,805 and \$4,210; E. H. Rawlins & Sons and James N. Wright, Denver, rate of interest 5 and 4½ per cent., premiums \$6,180 and \$515; Lumberman Trust Co., Portland, rate of interest 4% and 4½ per cent., premiums \$2,636 and \$356; Sweet, Causey, Foster Co., Portland, rate of interest 5 and 4½ per cent., premiums \$5,415 and \$531; John E. Price and Carsten & Earle, Inc., Seattle, rate of interest 5%, 4% and 4½ per cent., premiums \$4,155, \$760 and \$1,110; International Trust Co., Denver, rate of interest, 5 and 4½ per cent., premiums \$5,257 and \$17; Keeler Bros Co., Denver, rate of interest, 5 per cent., premium \$3,675; J. H. Sutherlin & Co., Kansas City, rate of interest 6, 5½ and 5 per cent., premiums \$8,765, \$4,425 and \$1,605; Citizens Bank, Pocatello, rate of interest 4½ per cent., premium \$50; Terry Briggs & Co., Toledo, rate of interest 5 per cent., premium \$3,795; Security Savings Bank & Trust, Toledo, rate of interest 5 per cent., premium \$3,045; Union Trust Co., Spokane, \$75,000 and \$75,000, rate of interest 4½ and 5 per cent., premium \$2,460; C. H. Coffin, Chicago, rate of interest 6 per cent., premium \$2,051.

**Pocatello, Id.**—Ferris & Hardgrove, Seattle, Wash., successful bidders for the \$150,000 bond issue for making renovations and improvements on the municipal water system. Contract was for the bonds bearing interest at 4½ per cent. per annum, they agreed to pay par and accrued interest and also a premium of \$1,735.

**Chillicothe, (Morton Grove), Ill.**—The members of the engineering committee of the sanitary district voted to concur in the recommendation of the chief engineer that a filtering bed to cost \$16,000 be constructed in the village of Morton Grove. The filtering bed is to do away with the contamination of the north branch of the Chicago river. Address George M. Wisner, Chief Engineer.

**Chicago, Ill.**—Sealed bids will be received, Room 406, City Hall for furnishing and delivering to the City, f.o.b. cars, by teams at the City Pipe yards, approximately 300 tons of special castings for cast-iron pipe and according to specifications on file in the office of the department of Public Works. Address Frank I. Bennett, Commissioner of Public Works.

**East St. Louis, Ill.**—The City Water Co. has arranged to lay a 36-in. main to Granite City, to lead from the East St. Louis plant, and it is expected that in the near future arrangements will be made to have the company furnish city with water, replacing the municipal plant of that place.

**Kendallville, Ind.**—Council discussed problem of inadequate water supply and Dr. H. O. Williams, secretary of the city board of health, was authorized to consult Dr. Mitchell, of Indianapolis, concerning the matter.

**Ankeny, Ia.**—See "Sewerage."

**Huxley, Ia.**—The citizens have under contemplation the installation of municipal water works plant. Address Town Clerk.

**Laurens, Ia.**—Bonds have been voted for extension of water works systems, private plans, will mature in the spring. R. V. Neville, City Clerk; \$15,000 will be expended.

**North McGregor, Ia.**—The council is planning ways and means to install a waterworks and sewerage system. Address Town Clerk.

**Spencer, Ia.**—A light and water system will be established here at a cost of \$50,000. Address Town Clerk.

**Lawrence, Kans.**—The citizens' advisory water committee will advise the city to purchase a new site for the municipal water plant at 3d and Indiana streets for \$9,000.

**McCracken, Kans.**—Citizens voted \$30,000 bond issue for water and light plant.

**Moran, Kans.**—Bids received by city in January for water and light.

**McKee, Ky.**—To build water works and electric light plant, an election will be held by the city in April to vote \$60,000 bond issue.

**Richmond, Ky.**—Bond issue \$50,000 to build water works will be held in March. B. R. Dougherty, supt.

**Jamaica, L. I.**—Local Board will act Jan. 25 upon a petition requesting the construction of an automatic electric pumping station at Thrall and Beaufort avenues, Fourth Ward, and for the laying of a 10-inch force main in Beaufort Ave. from Thrall Ave. to Hatch Ave.

**Lunenburg, Mass.**—Citizens discuss public water system. A survey of the Whalom district will be made by J. L. Bryne, contracting engineer, of Boston and estimates for which he will build and equip the system will be submitted Feb. 6.

**Constantine, Mich.**—The question of issuing \$10,000 in bonds to secure a more adequate water system is under consideration. Address E. S. Hotchin, Village Clerk.

**Flint, Mich.**—See "Streets and Roads."

**Sturgis, Mich.**—See "Sts. and Roads."

**Carter, Mont.**—Town planning to install a water system to supply this town with water. The plan is to get the supply from the Teton river, about six and a half miles away.

**Norfolk, Neb.**—To vote \$10,000 water bonds city plans election.

**Asbury Park, N. J.**—City commissioners considering purchasing a 3,000,000 gal. pump to be used at the water works.

**Burlington, N. J.**—Bids received Feb. 6 for \$20,000 worth of 4½ per cent. refunding water bonds. Said bonds will be for the sum of \$500.00 each, in coupon form, and made payable in twenty annual installments, commencing the first year after their date.

**Garfield, N. J.**—Borough council decided to purchase an air compressor for the wells at the water plant. No definite type of compressor was decided upon.

**Mendham, N. J.**—Plans for the construction of an 8,000,000 gallon reservoir considered by Council. Estimated cost, \$10,000.

**Montclair, N. J.**—Town commissioners contemplate water works. E. M. Harrison, mayor.

**Cape Vincent, N. Y.**—Board of Water Commissioners want special election in March for \$10,000 bond issue, \$3,500 of this amount to refund the present water bonds, \$2,500 to construct another stand-pipe, and \$4,000 to meter the water system.

**Rochester, N. Y.**—City Engineer Elwood is preparing specifications for the remaining section of the third line of conduit from Hemlock Lake. The conduit 37-in. pipe has been laid as far as Rush Reservoir. The cost of the 91,000 ft. already laid has been about \$800,000, including pipe, hauling and laying. The contract to be let will call for about 7-10 miles of pipe. This may be either cast iron pipe or steel lock-bar pipe. The specifications will be so drawn that, if desired, bids can be made separately on the pipe, hauling and laying. Bids on the final section will be advertised for within a short time.

**Watertown, N. Y.**—The abandonment of further hopes of securing a fresh water supply from the Pine Plains has been recommended. Now attention will be given to installing adequate filtration extension to provide the city with water from Black River for some time to come. Council authorized the water board to go ahead with its plans to spend \$53,000 or more to install the eight new filters and two coagulation basins that will protect the city from a water famine.

**Bowman, N. D.**—A \$20,000 bond issue for the drilling of wells and laying of mains may be authorized by city.

**Akron, O.**—Delegation of business men appeal to State administration for a new reservoir, cost \$34,000.

**Canton, O.**—Mayor Stolberg's program of improvements to solve the water situation as outlined to council. Issuing \$250,000 bonds for construction of a 20,000,000 gallon reservoir; appropriation of \$4,000 to drill test wells; erection of a temporary subpumping station; reinforcing of the city mains with a 24-inch main leading to the reservoir; installation of low lift pumps at the central station and construction of a million gallon covered basin in Waterworks Park.

**New Berlin, O.**—Village council start-

ed action to get another pump for the water works department and to drill another deep well for additional supply.

**Tiffin, O.**—Council proposes to build a low water concrete dam across the Sandusky River to keep the water level in the river above the mouth of the sewers that empty into the stream. This is an attempt to satisfy the state board of sanitation that threatens to force the city to build a sewage disposal plant.

**Urban, O.**—City plans waterworks system. L. Burnham, Supt.

**Wooster, O.**—For the purpose of furnishing a water supply for the city waterworks bonds for \$80,000 will be sold Feb. 8th by Fred E. Taber, City Aud.

**Muskogee, Okla.**—More hydraulic bigger mains in the business section and improvements at the pumping station are recommended. Address Mayor Wyand.

**Okemah, Okla.**—Bond issue of \$7,000 to build water works voted by city.

**Raw City, Okla.**—For waterworks construction city voted \$15,000 bonds.

**Flemington, Pa.**—For improving water system, department of health approved plan of Flemington Water Co.

**McKeesport, Pa.**—For \$90,000 water bonds bids will be received Jan. 29, 1 p. m. H. S. Jaycox, Supt. of Accounts & Finance.

**Punxsutawney, Pa.**—For the installation of a municipal water works system Council is making arrangements to dispose of a \$400,000 bond issue.

**Quarryville, Pa.**—Residents are discussing purchasing the plant of the Quarryville Water Co.

**Roaring Springs, Pa.**—Plans for an increased water supply considered by Borough Council.

**Bishopville, S. C.**—Engr. J. B. McCrary Co. of Atlanta, Ga., will prepare plans for waterworks and sewerage systems; \$45,000 will be expended. Surveys are now under way. Address the Mayor.

**Chesterfield, S. C.**—The city will expend \$45,000 in constructing a waterworks and sewerage system. J. B. McCrary Co. of Atlanta, Ga., have prepared plans. Surveys are under way.

**Flandreau, S. D.**—A. Locke, Supt. City plans to improve water system.

**Knoxville, Tenn.**—Seasongood & Mayer, Cincinnati, successful bidder for \$225,000 waterworks improvement bonds issued at a premium of \$8,255.

**Knoxville, Tenn.**—Seasongood & Mayer, Cincinnati, purchased \$225,000 water works improvement bonds, premium of \$8,255.

**Knoxville, Tenn.**—See "Sewerage."

**Paris, Tenn.**—The council will petition legislature for necessary authority to issue bonds for filtration plant. Address Mayor.

**San Angelo, Tex.**—With a daily pumping capacity just increased by 2,000,000 gallons, the San Angelo Water, Light & Power Co. is now preparing to increase its storage capacity by the building of an additional dam sufficient to supply the city with water when it shall have grown to 50,000 inhabitants, according to announcement of R. J. Irvine, manager. The cost will be in the neighborhood of \$10,000 and the work is to be begun as soon as the details of arranging and letting the contract have been disposed of.

**San Benito, Tex.**—Installation of water purification plant for this city considered by Rio Grande Valley Ice Association, Houston.

**Wilmer, Tex.**—An election will be held to vote on \$15,000 water bonds. Address the Mayor.

**Charleston, W. Va.**—An election will be held in the near future to vote on the question of issuing water bonds; \$140,000.

**Madison, Wis.**—The Chicago Northwestern Ry. will make improvements in the railway grounds. The specifications include 100,000-gal. steel water tank with well and pumphouse, septic tank and filter bed, at a total cost of \$25,000. Address Lee Jutton, Division Engr., at Madison.

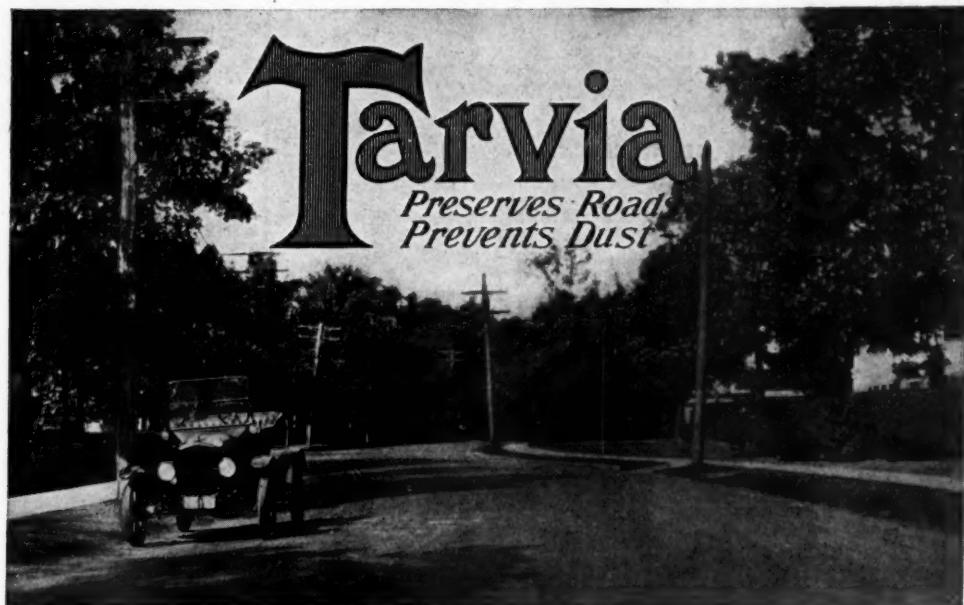
**Manson, Wis.**—See "Sewerage."

**Orting, Wis.**—Council instructed mayor to call special election within 30 days to vote on proposition of acquiring two water systems and converting them into a municipally owned system.

**Dartmouth, N. S.**—See "Sewerage."

**Hamilton, Ont.**—The Board of Works is being asked by the controllers to deal with the question of water supply for Barton Twp.

**Niagara Falls, Ont.**—Supt. Warder, of the Waterworks Dept., has recommended the construction of a larger main on



*Everett Avenue, Winchester, Mass.  
Constructed with "Tarvia-X" in 1915.  
Treated with "Tarvia-B" in 1916.*

## *Tarvia vs. Oil*

**L**IKE many towns, Winchester, Mass., tried both oil and Tarvia to preserve its roads and prevent dust. In 1915 the Superintendent of Streets reported to the Selectmen as follows:

"I recommend a change in the methods of oiling. I would eliminate contract oiling because of its bad results, and I would increase the tar treatment (Tarvia) because of its durability, cleanliness and smaller unit cost of up-keep. I would not use so-called asphaltic oils on any streets except Forest Street and Highland Avenue. The non-asphaltic oils require no sand and do not make mud if they are sprayed on clean surfaces. It is expensive to apply one coat of oil and sand and then remove several layers of oily mud after each rain."

In their annual report the Selectmen quoted the above, and then said:

"We believe the result has justified his recommendations and that the streets are better preserved and in the course of time will cost far less for repairs and be more nearly dustless by this method (Tarvia) than if

oil were used. The condition of our Square this winter as compared with previous years, when oil was used, is good proof of this. After rains, the road-bed dries quickly and is never covered with an oily mud."

The Tarvia referred to in the Winchester report was "Tarvia-B." The road was cleaned, the "Tarvia-B" was applied cold from a pressure distributor, and spread evenly over the surface. In a few hours it soaked well into the macadam, forming a tough, slightly plastic binder. The carpet of Tarvia-bonded stone thus formed was durable, waterproof and dustless. The expense was trifling—the results most satisfactory.

This method is the cheapest as well as the best way of maintaining macadam.

There are three kinds of Tarvia and a dozen ways of using it.

*Booklet describing the various treatments on request. Address our nearest office.*

### Special Service Department

This company has a corps of trained engineers and chemists who have given years of study to modern road problems.

The advice of these men may be had for the asking

by anyone interested.  
If you will write to the nearest office regarding road problems and conditions in your vicinity, the matter will have prompt attention.

## *The **Barrett** Company*

New York      Chicago      Philadelphia      Boston      St. Louis      Cleveland      Cincinnati      Pittsburgh  
Detroit      Birmingham      Kansas City      Minneapolis      Nashville      Salt Lake City      Seattle      Peoria  
THE PATERSON MFG. CO., Limited:      Montreal      Toronto      Winnipeg      Vancouver      St. John, N. B.      Halifax, N. S.      Sydney, N. S.



# Alexander Reed

In connection with the

## Franklin Contracting Co.

52 Vanderbilt Avenue, New York

Will Have an Exhibit of

## NATIONAL PAVEMENT

At Booth 67

## American Road Builders' Show

Boston, February 5 to 9

Morrison St., west of Victoria Ave., to  
Fourth St.

### BIDS RECEIVED AND CONTRACTS AWARDED.

(\*Indicates Contracts Awarded.)

**Farmington, Minn.**—See "Sewerage."  
**Allenhurst, N. J.**—\*A. S. Cameron  
Steam Pump Works, 11 Broadway, New  
York, at \$5,762, pumping equipment. C.  
E. King, borough clerk.

**Long Branch, N. J.**—\*Benjamin A. Van  
Brunt, Ocean Ave., Seabright, N. J., for  
concr. flume bulkhead, wood flume and  
dredging near Ocean Front, Long  
Branch, \$4,500; by Takanassee Lake Im-  
provement Co., care Chas. W. McCarthy,  
132 W. 27th St., New York City. Geo.  
McC. Taylor, Consulting Engr., Broad St.,  
Red Bank.

**Cleveland, O.**—Resolution by the board  
of control that the director of public  
utilities be and he is hereby authorized  
and directed to enter into contract with

\*Alabama Pipe & Foundry Co., for ap-  
proximately 206 tons of valve boxes for  
the division of water in the amount of  
approximately \$10,000 in accordance  
with its bid received Dec. 27, 1916.

**Scituate, R. I.**—\*E. W. Foley Constr.  
Corp., New York City, at \$133,400, for  
building stream control works for main  
dam of Scituate Reservoir, consisting of  
diverting Pawtucket River and con-  
structing permanent water gate; \$8,000,-  
000. Engr. Frank E. Winsor, 561 West-  
minster St., Providence, R. I. Jos. H.  
Gainer, Mayor, Thos. Potter, chmn. wa-  
ter supply board, City Hall, Providence.

**Knoxville, Tenn.**—Six bids upon 1,000  
to 5,000 water meters were opened by  
the Knoxville water commission. No  
contracts were awarded.

**Milwaukee, Wis.**—Water department  
for the purchase of 50,000 pounds of  
liquid chlorine to be mixed in the water  
which is being pumped through the city  
mains. \*Arnold Hoffman Co., 13½ cts. a  
pound.

### MISCELLANEOUS.

**San Diego, Cal.**—City Council decided  
February 21 the date for voting to is-  
sue \$682,000 bonds for rebuilding Lower  
Otay Dam.

**Waterbury, Conn.**—Supt. McDonald of  
the water department was given auth-  
ority to purchase a motor truck.

**Tampa, Fla.**—Bonds to the amount of  
\$2,000,000 have been sold for a 60-mile  
electric line connecting Tampa and St.  
Petersburg.

**St. Petersburg, Fla.**—City Comm. has  
completed arrangements for a \$180,000  
bond election to be held February 16 to  
provide funds for civic improvements,  
chief among which are the waterfront  
improvement.

**Brazil, Ind.**—Bids received Feb. 8,  
1917, at 10 a. m., by Treasurer of Clay  
County, for sale, \$143,803 drainage bonds,  
5 per cent, ten years. Wm. O. Graeser,  
Aud.

**Crown Point, Ind.**—Lake County ditch  
bonds to the amount of \$7,800 were sold to  
Breed, Elliott & Harrison, Indianapolis, for a premium of \$66.50. Bonds bear 5 per cent and cover a period of  
five years.

**Indianapolis, Ind.**—City Controller  
Reginald Sullivan for the \$300,000 tem-  
porary loan to the city, awarded to the  
\*Fletcher-American Natl. Bank, who  
will pay \$165 premium and charge 1½  
per cent per annum interest. The date  
of the maturity of the loan is May 28,  
1917, \$200,000 of the money to be fur-  
nished today, Jan. 15, and the other  
\$100,000 on Feb. 15, 1917. The other  
bidders were: Meyer-Kiser Bank, 2 6-10  
per cent interest, less \$35 premium; Indiana  
Trust Co., 3 per cent for \$200,000  
portion, and 2 per cent for \$100,000 portion,  
less \$35 premium; J. F. Wild & Co.,  
2 per cent, less \$13 premium; First Trust  
& Savings Bank of Chicago, 1½ per cent.

**Kendallville, Ind.**—City Council au-  
thorized the purchase of tract along  
Bixler Lake for park, at \$7,000.

**Knox, Ind.**—Bids received Feb. 10,  
1917, at 2 p. m., by Treasurer of Starke  
County, for sale, \$4,528.30 and \$6,172.86  
ditch bonds, 5 per cent, ten years. John  
L. Kesler, Treasurer.

**Hutchinson, Kan.**—Citizen requests  
that city build a retaining wall along  
Cow Creek on his property south side  
of Ave. B. City Engr. McLane estimated  
the wall, about 160 ft. long, would cost  
\$800. It was referred to Comr. of  
Streets Buskirk and City Engr. to in-  
vestigate and try to reach an adjust-  
ment.

**Shreveport, La.**—Board of Health passed  
resolution recommending to the city  
commissioners that four small incinera-  
tors be installed in suitable localities  
so that all garbage and night soil can be  
burned.

**Beverly, Mass.**—City Engineer Harry  
L. Whitney suggests in his annual re-  
port that an automobile be secured for  
the department or used in co-operation  
with other departments.

**Beverly, Mass.**—Committee on public  
service and aid presented an order re-  
questing the mayor to make a recom-  
mendation for an appropriation of \$6,000  
for a motor truck to be used for the col-  
lection of ashes.

**Waltham, Mass.**—The committee on fi-  
nance passed favorably on the request of  
Supt. Holbrook for transfer in ac-  
counts of \$500 for the purchase of a run-  
about auto.

**Detroit, Mich.**—Common Council au-  
thorized the sale of \$100,000 worth of  
grade separation bonds.

**Webb, Mo.**—Construction of municipal  
electric and ice works under considera-  
tion.

**Webb City, Mo.**—The Commercial Club  
endorsed the movement started by the  
light committee of the council to build  
a municipal light and ice plant.

**Clifton, N. J.**—Chief of Police William  
J. Coughlan in his annual report recom-  
mends the installation of street tele-  
phones, also a patrol ambulance be pur-  
chased and that the old motorcycles be  
sold and new ones purchased.

**Garfield, N. J.**—Chief of Police John A.  
Fross in his annual report recommends  
the purchase of an automobile.

**Rutherford, N. J.**—Council finally  
agrees to the proposed Park Avenue  
crossing elimination as proposed by the  
Erie Railroad and approved by Rutherford.  
The contract was ordered signed  
and will go to the Public Utility Com-  
missioners for a regular order; island  
platform, iron gates between the tracks  
closing tightly and other precautionary  
measures as specified in the contract.

**Trenton, N. J.**—Mayor proposes city square. Would have it created at the westerly end of the proposed Assumpink Way. Would practically take in all of the area bounded by Factory St., Warren St., the Assumpink Creek and Broad St., a total of about 95,000 square feet, or 14,000 sq. ft more than the area of the square suggested by Commissioner La-Barre. He plans for city square to be located in the area bounded by East Hanover St., Warren St., a continuation of W. Hanover St. from its present easterly end of Broad St., and Broad St., embracing about 81,000 sq. ft. The total cost of this plan is estimated at about \$800,000 under the Mayor's plan. The square as a single project would cost approximately \$300,000 and if linked up with the proposed Assumpink way it would necessitate a total expenditure of about \$1,000,000 for the square and boulevard together. Mayor Donnelly's plan has been reduced to a drawing by Joseph E. English of the City Engineer's department.

**Trenton, N. J.**—Bd. of Freeholders sanctioned the purchase of a road runabout for use of the County Road Supervisor, and the purchase of a \$900 Chalmers Roadster for Freeholder McCullough.

**Cohoes, N. Y.**—The state has approved the plans for the Cohoes barge canal terminal, which means that the terminal will be complete when the waterway is opened for navigation in 1918. The plans call for a terminal with 500-ft. frontage, to cost \$61,000, on the west side of the Hudson River north of the 12th St. Bridge. Bids will be advertised for in about three weeks, and it is expected that construction will begin early in the spring.

**Saratoga Springs, N. Y.**—The state of New York is negotiating for the purchase of Canfield Park in this city on which to build a bathhouse and drink hall at cost of \$750,000.

**Yonkers, N. Y.**—The extension of the Bway subway from its present terminus at 242d St. to the Yonkers city line was urged by the Bway Extension Association. A committee was appointed to call on the Transit committee of the New York Bd. of Estimate and attempt to have that body take immediate steps to cause the construction of the proposed extension.

**Winston-Salem, N. C.**—City plans to issue \$80,000 bonds for necessary and permanent improvements made during the past two years.

**Hamilton, O.**—The Cleveland Ditch in Oxford Twp. will be sold February 14.

**Port Clinton, O.**—The Ottawa county commissioners have granted the improvement of the La Carp Ditch, which will cost about \$7,000, and is over six miles in length. The ditch starts in Erie township.

**Springfield, O.**—City Manager Charles E. Ashburner has been authorized by the city commission to expend \$7,000 for a new police signal system and \$4,000 for a new motor driven street sweeper. Bids are to be asked for on this equipment within a short time. Communications should be addressed to the city manager.

**Carbondale, Pa.**—Bd. of Pub. Wks. considering the installation of a system of collection and disposal of garbage. E. J. Healey, Commr.; J. A. Saxe, Engr.

**Erie, Pa.**—Plans of Louis G. Krause, engineer of the State Public Service Commission, for removal of the switch across Parade St. into the plant of the Germer Stove Co. at 16th St. to make way for the Parade St. subway, approved by Supt. Clark and Attorney Sam Y. Rossiter, of the Pennsylvania Railroad Co., with City Council. Plans and data for building the retaining walls for the subway, laying high and low-tension conduits from 14th to 16th Sts. and paving the street and laying a sidewalk are now being prepared in the city engineering department. Ordinance will be introduced in council within a month.

**Hazelton, Pa.**—George D. Fox & Sons, Philadelphia, successful bidders for city's \$60,000 bond issue for permanent improvements, premium of \$1,640.50; other bidder M. M. Freeman & Co., Philadelphia, offered a premium of \$1,550.

**Providence, R. I.**—Improvement of the public garden and between the Union Station and the State House, at a cost of \$250,000, will be recommended to the city council and the general assembly by the joint state and city commission.

**Columbus, S. C.**—See "Streets and Roads."

**Sumter, S. C.**—The election for the issuance of \$22,000 additional bonds resulted in a victory.

**Winnisboro, S. C.**—The Better Winnisboro Club have decided to erect a drink-

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**PHOENIX, ARIZ.**

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**MONTREAL, P. Q.**

ing fountain material of Fairfield granite.

**Bristol, Tenn.**—County commissioners passed resolution calling for bids for the sale of the Zenith dock and the land upon which it is situated, and the Portage dock and the land upon which it is situated, for the 19th day of February.

**Everett, Wash.**—Reports have been completed by Perry Niles, of this city, for proposed improvements in Drainage Dist. No. 5 involving the construction of several thousand feet of drainage ditches. County Comrns. approved project and bids will soon be called for.

**Vancouver, Wash.**—County commissioners authorized the purchase of a new automobile to replace that used by the county sheriff.

**St. John, N. B.**—As soon as the Public Works estimates are passed tenders will be called for a supply of asphalt. R. W. Wigmore, Commr.

**Chatham Twp., Ont.**—Repairs and improvements to a number of drains proposed by Twp. Council Engineer W. G. McGeorge, 152 Queen St., Chatham, Ont.

### BIDS RECEIVED AND CONTRACTS AWARDED.

(\*Indicates contracts awarded.)

**Norwich, Conn.**—Highway Commissioner Bennett received bids for the elimination of the grade crossing at Bolton Notch. Will be awarded in a few days. Estimate of the work is \$40,000.

**Flint, Mich.**—Establishment of a garbage collection and disposal system for the city common council authorized the mayor and the city clerk to sign a contract with the United Disposal and Recovery company as soon as the location of the disposal plant had been determined and a satisfactory bond filed. A garbage ordinance to conform with the provisions of the new contract passed its second reading and was referred back to the ordinance committee for one week.

**Passaic, N. J.**—William H. Truesdale, president of the Lackawanna and A. E. Chambers, secretary of the company, signed contract between the City of Passaic and the Lackawanna Railroad Company for the elimination of the two

grade crossings at Passaic and Van Houten Avenues. Zabriskie A. Van Houten, city clerk.

**Brooklyn, N. Y.**—Public Service Commission for the construction of the Livonia Avenue elevated extension of the Eastern Parkway subway in Brooklyn. For supply the steel, American Bridge Company, \$1,481,755 and for construction to W. G. Cooper, \$257,164. This extension is a two-track line reaching from East 98th and President Sts. to Ashford St. and Livonia Ave.

**Columbus, O.**—Director of Public Service George A. Borden opened bids for furnishing boiler and equipment to be used at the garbage reduction plant. The contract has not been awarded. Following were the bidders: Erie City Iron Works, \$6,000; Heinie Safety Boiler Co., \$8,735; Springfield Boiler & Mfg. Co., \$7,500; Ross-Willoughby Co., \$6,700; the Wickes Boiler Co., \$6,749.

**Wilkes-Barre, Pa.**—City Commissioner Fred Goeringer announced that incineration method of garbage is approved. Mayor and commissioner will vote for awarding the contract to the Wilkes-Barre Disposal Co.; bid \$22,000 per year for a period of ten years for garbage disposal by incineration.

### Too Late for Classification

#### STREETS AND ROADS

**Tucson, Ariz.**—Gen. Frederick Funston, commanding the border troops, has authorized the expenditure of \$9,000,000 for the construction of a military highway from the military reservation at Fort Huachuca to eliminate roundabout routes from Douglas to Nogales and other border points, according to advices received. The military highway will connect the highway of the borderland route at Hereford with a completed road built by the forestry service from Canille to the base of the Huachuca. It will give practically direct good roads from the military reservation at the fort to Nogales, Lochiel, Naco, Bisbee and Douglas on the border and to Tucson and interior communications.

**Boise, Ida.**—City council discussed street paving. C. C. Stevenson, city engineer, submitted a report on the approximate cost of paving a strip 20 ft. wide through the center of the street with gravel and with bitulithic. The former, he estimated, would cost something over \$753 per front foot and the bitulithic \$1.98. The approximate cost of maintenance of a gravel strip would be 11 1/4 cts. per ft. per annum, and the maintenance cost of bitulithic 1 ct. per ft. per annum. The city engineer was instructed to get further figures on both kinds of paving, the cost per mile of the recent county roads, etc.

**Columbus, Ind.**—Bids received Feb. 15, 1917, at 2 p. m., by treasurer of Bartholomew county, for sale \$26,200, \$43,200 and \$26,200 highway improvement bonds, 4 per cent., ten years. Ed. Suverkrup, Treasurer.

**Paoli, Ind.**—Bids received Feb. 5, 1917, at 2 p. m., by treasurer of Orange county, for sale \$4,330 and \$4,000 highway improvement bonds, 4 1/2 per cent., ten years. Oscar Standford, Treasurer.

**Washington, Ind.**—Bids received Feb. 12, 1917, at 2 p. m., by treasurer of Daviess county, for sale \$8,000 highway improvement bonds, 4 1/2 per cent., ten years. Elmer Buzan, Treasurer.

**Cedar Falls, Ia.**—City may extend the Main St. paving south to 27th St. and thence west on 27th to the city limits.

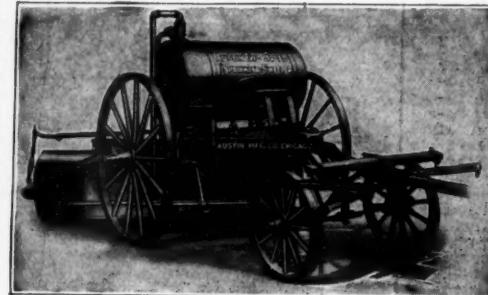
**Dubuque, Ia.**—The Dubuque-Wisconsin Bridge Co. has submitted a petition to the city council, asking that the street approaching the Dubuque end of the bridge be improved.

**Campbell, Ky.**—The city will soon let contract for reconstructing whole length of Main St.; estimated cost, \$75,000.

**Frederick, Md.**—Petition by Mayor Lewis H. Fraley is being circulated requesting that Chapel alley, between East Patrick St. and Church St., be widened.

**Lansing, Mich.**—United Travelers requests a \$15,000,000 state bond issue to complete the state trunk line highway system.

**Fergus Falls, Minn.**—Funds will be asked from the State and national governments for routing of a new state highway which will cross central Minnesota in a northwesterly direction was selected by Central Minnesota Auxiliary National Parks Highway Associa-



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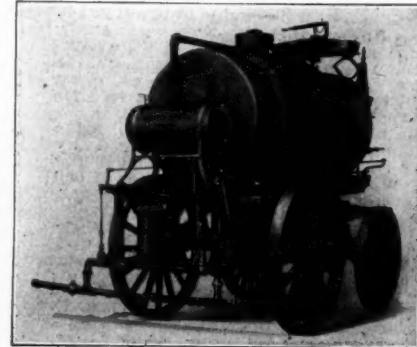
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**Minneapolis, Minn.**—See "Sewerage."

**Salem, Mo.**—Bids received by Clerk County Court, James H. McDonald, Feb. 5, at noon, for \$20,000 road coupon bonds.

**St. Joseph, Mo.**—City to widen and open Parie Ave. Joel E. Gates, City Clk.

**Plentywood, Mont.**—Through Sheridan county, running from Culbertson to Plentywood, and then west to Scobey, Westfork and over to Glentana. The State Highway Commissioners have designated a state highway and the plan has been submitted to the county commissioners with the view of this county securing federal aid.

**Columbus, Neb.**—City is contemplating paving in District No. 1, to cost about \$100,268. Wm. Becker, City Clk.

**Winston-Salem, N. C.**—Rockingham county commissioners are in favor of contributing good permanent roads in the county.

**Astoria, Ore.**—City receives bids Feb. 3 on \$90,000 refunding issue and \$50,000 of street improvement bonds.

**Butler, Pa.**—J. H. Anderson of the Universal Portland Cement Co., and L. A. Pettibone of the National Portland Cement Association, addressed county commissioners and Chamber of Commerce, giving figures on the cost of road making and maintenance. They suggested that Butler county be bonded in the sum of \$600,000 and that this money be used to build all the roads in the county that are needed at the present time. No action was taken.

**Hazleton, Pa.**—City council expects to take early action on the paving contracts for the year.

**Tacoma, Wash.**—Plans for summer road work are now being drawn in the

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### Notice.

The Borough Council of Washington, Warren County, N. J., will receive bids, or proposals, at a meeting of the Council, February 19, 1917, for the purpose of Lighting the Streets and Public Building of above said borough, either by electricity or gas, for a period of five years. The Council reserves the right to reject any or all bids.

Further information will be submitted to interested parties upon application to  
JACOB H. HAHN,  
Borough Clerk.

county engineer's office. Included among the probable improvements are the paving of a two-mile stretch of the Pacific highway from the top of Nisqually Hill to the Nisqually River, and a stretch of the mountain road. The hill road between Tacoma and Puyallup will be resurfaced.

TORONTO, Ont.—Commissioner R. C. Harris has recommended an asphalt pavement to be laid on Devonshire Pl. from Hoskin Ave. to Bloor, at a cost of \$14,285. He has reported against a proposal to extend Edgewood Ave. to Wrenson road.

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TENDERS (closing on February 26th) are invited by the City of Saint John, New Brunswick, for about 400 tons of asphalt. G. F. FISHER, Commissioner P. W. D.

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TORONTO, Ont.—New sidewalks will be constructed at Ward's Island.

### BIDS RECEIVED AND CONTRACTS AWARDED.

(\*Indicates Contracts Awarded.)

Algona, Ia.—J. S. McLaughlin & Sons, Red Oak, Ia., on asphaltic concrete pavement and 42-in. curb and gutters, two coat construction, class B, with concrete alley and alley return pavement. Theo. S. De Lay, consulting engineer, Creston, Iowa.

Dubuque, Ia.—By council for the improvement of North St. to the \*O'Farrell Contracting Co., at \$1,345 for grading, 55 cts. per lin. ft. for curbing and gutter-

ing and 70 cts. per sq. yd. for macadamizing.

Dubuque, Ia.—\*J. M. Kenety & Son for improving of Pfohl St. and Unks St.

### SEWERAGE

Detroit, Mich.—City Engineer Clarence W. Hubbell informed board of public works the city must spend \$16,000,000 to complete its sewer system in newly annexed territory and to establish sanitary treatment stations for the whole city system. It will cost \$10,000,000 to build the sewers in the 31 square miles of new city territory and the balance is the treatment stations estimate.

Minneapolis, Minn.—Special finance committee recommended to the city council new bond issues aggregating \$1,300,000 to finance bridge, sewer and paving construction and provide for the purchase of motor-driven apparatus for the fire department.

Joplin, Mo.—J. B. Hodgdon, commissioner of streets and public improvements, may be ready to submit figures to the city council at their next meeting on cost of building a storm sewer in District B.

Grand Island, Neb.—City engineer's estimate of \$516.12 on the cost of constructing District No. 52 from Vine St. to Plum, between 10th and 11th, was adopted and the city clerk instructed to advertise for bids.

Trenton, N. J.—City authorizes \$40,000 sewer bonds.

Sebring, Ohio.—Eugene H. C. Strattan is preparing estimates for \$70,000 sewer system. The question of issuing bonds will be submitted to vote. Address City Auditor.

Erie, Pa.—Mayor Miles B. Kitts will confer with State Health Commissioner Dr. S. G. Dixon in Harrisburg, Jan. 29, on construction of a sewage treatment plant, he informed council at a conference in his office. Also confer with former legislative colleagues on local enactments, including a bill appropriating \$55,000 for dredging west canal basin and building a retaining wall on the west side of lower State St.

### BIDS RECEIVED AND CONTRACTS AWARDED.

(\*Indicates Contracts Awarded.)

Clinton, Mass.—Edward DeCourcy, agent for the board of health, may be given the contract to extend the sewer along Wilson St. He is willing to take the contract for \$1,200.

Portland, Ore.—Bids for the reconstruction of the Tanner Creek sewer were opened by the council. J. F. Shea and William Lind were the lowest bidders, \$302,800. Jacobsen-Jensen Co., \$303,921, and Giebisch & Joplin, \$309,172.

### WATER SUPPLY.

Savannah, Ga.—City will advertise for the boring of a 12-inch well. According to the estimate of Chief Engineer Conant, cost about \$5 a ft. or \$6,000 for the 1,200 ft.

Eugene, Ore.—Southern Pacific Co. is seeking a 5-year franchise for maintenance and operation of a water pipe line from the bank of the Willamette River at foot of Polk St. to the company's right of way and for operation of a pumping plant.

Williamsport, Pa.—Council ready to construct water works for city. Passes resolution, directing city solicitor to determine whether there are any legal obstacles to block plan.

Kadoka, S. D.—An election will be held to install a municipal water works system. Address Town Clerk.

Bristol, Tenn.—City commission have decided to ask the state legislature for permission to issue bonds in the sum of \$10,000, the money to be used for making the Carmack spring, near Bristol, available as a part of the city water supply.

Terrell, Tex.—City commission ordered a special election Feb. 20 to determine whether or not a water supply contract made by the commission with W. C. Porter and D. M. Weatherford would be ratified by the people.

Bellingham, Wash.—Two water main extensions before council and Water Supt. Thos. Slater has been instructed to prepare estimate.

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